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FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

War Time Dilution.

WHEN the emergency measures which have been taken by the Government during the present war come to be considered hereafter in their true perspective, the one happy outstanding step to promote greater efficiency, and enable at the same time the majority of the fighting manhood of the country to take its place at the front, will, we verily believe, prove to be "dilution." Although in this great step towards multiplying the output of our munition and commercial manufacturing firms we have in mind the invaluable aid which the introduction of "unskilled" labour—especially that of women—to work side by side with "skilled" labour has brought about, we also place very high in the scale of efficiency-building the "dilution" in another direction which has been such a feature of recent legislation towards looking after the "spiritual" side of the community's well-being. The ever-increasing importance of this dilution of our labour powers since we wrote an article a few weeks back upon the subject, has been especially emphasised again during the last few days. To take only one instance, there is the termination of the very reprehensible strike which lasted close on a week at Barrow in opposition to the introduction of the system of diluted labour amongst the engineers, &c., at the works of Messrs. Vickers, Ltd., and which was only settled at the week-end.

Here we had once again the shocking spectacle of a body of men allowing the ordinary trade customs of normal times to stand in opposition to the urgent and vital needs of the Empire, knowing full well—or they should know—that by such action they might, in all probability, be jeopardising the lives of numbers of our men—possibly even their own kith and kin—who are helping with the big push which about the same moment was commencing to free the world of the menace of Hun tyranny. This tyranny was not only to be of a military character, but had every promise of being a substitute under a new guise of ancient slavery for the entire world—including the working-men of every denomination in this country. No truer thing of this war has been said than that it is a people's war, but it seems to be a long, long time before a large section of the workers appears to be able to grasp this significant fact. In helping our men at the front to win through by the necessary plentiful supply of munitions, in every sense of the word, the skilled worker is not only helping the Empire as a whole, he is helping the entire civilised world to obtaining a more generous enjoyment of life, and last, but not least, is laying the foundation for very materially enhancing the position and interests of the workers themselves throughout the Empire in the future. It is towards this same end that the decisions have been come to at the recent Paris Economic Conference. By carrying these out upon their broadest principles no section of the community is likely to benefit more materially than the industrial side of the country and its millions of workers. Hitherto the greatest cause of low wages, want of employment, and all their consequent evils has been the steadily increasing competition from the German peoples in dumping their inferior state-bounty-fed goods all over the world, and especially into England. All this has been to the detriment of our vast army of workers, and leaving out of the question the one great principle of the right of small nations to exist as free and independent states, for which Great Britain entered this horrible European conflict, the worker of the world has all his future interests bound up in the outcome of the war; victory spells for him prosperity in the days to come, with the chief breaker down of prices and wages either entirely eliminated or so handicapped as to be for many years powerless to continue his economic slavery; to lose the war or to allow the end to be a compromise, means that the lot of the people would be seriously worse than in the past. Such a climax to this war of nations is therefore unthinkable. But with such a doctrine as opposition to greater output whether by dilution of labour or otherwise, being able to hold good for but a week, is a very trenchant argument in favour of the powers under the Defence of the Realm Act being brought into operation, if only in the interests of the very body of men who are so short-sighted and obstinate as to fight against their own interests. On all sides there is clear evidence of the helpful work which has been possible by the organisation of the unskilled workers and their introduction into the factories for some particular job. Particularly in most of the "shops" female labour has been found entirely suitable and productive of the best results. How it is possible, therefore, under the present conditions that resistance from the men can still obtain is almost beyond understanding. When once the position is really grasped by the men, however, it is gratifying to find that they respond in the only possible way, and the thanks of the nation are due to those statesmen who are bringing their personality to bear in inducing the masses to appreciate the true state of affairs. It was almost entirely due to Mr. A. J. Balfour that recently the Clyde difficulties were smoothed over, and this principle of dilution recognised as a temporary war measure. Mr. Balfour's arguments, which were unanswerable and brought about peace in the Clyde yards, were put forward in a letter for the benefit of the malcontents as follows:—

"The serious shortage in the number of skilled men available for Admiralty work is causing the Board of Admiralty much anxiety. There is one way, and only one way, in which this evil can be mitigated, namely, by what is called the dilution of labour. This, through the patriotic co-operation of the skilled men, has been applied with the greatest success in the engineering shops in the Clyde district. It is all important that it should be extended as soon as possible to the shipyards also, and the Commissioners appointed for the purpose have accordingly been requested to undertake the necessary arrangements with all possible expedition.

"I should be glad if you will convey both to employers and employed my sense of the urgency of this step. During the period of the war nothing short of an ample scheme of dilution will meet naval requirements and secure national safety.

"I have watched with close interest and high appreciation the loyal way in which the skilled men on the Clyde have assisted dilution in the engineering shops. I do not for one moment doubt that their patriotic example will be followed by those engaged on national work in the shipyards."

The desired result followed this appeal of the First Lord of the Admiralty, and it is to be hoped that with the smoothing out of the Barrow episode, the last of this insane and unpatriotic agitation has been heard. In regard to the willing work of women, it is highly ungenerous for difficulties to be put in the way of their co-operation, in view of the splendid record which they have already achieved in almost every direction. The tribute on Monday of the Postmaster-General to their level-headedness under trying conditions was well earned. Said Mr. Pease, in giving a *résumé* of the past work of the Post Office: "When the Zeppelin raids have been anticipated, sometimes when they have been going on, the women have come out of their homes to their work—even when bombs were dropping. They have played an important part in the scheme of air raid warnings, and have set a very good example to the whole country."

It is not only under fair weather conditions that woman, as "diluted" labour, has made her mark, but wherever her efforts have been allowed proper scope, it has been found that the many supposed objections to her doing her bit for the country have very quickly melted into thin air. Once more, therefore, we urge one and all manufacturers to study this great scheme of diluted labour to its utmost length, so that there may be no possibility of finding the supplies of munitions—and in this category is included aircraft—falling short, just at the critical moment when the call may prove to be more urgent than ever for completing what we all hope for presently—a sweeping and unequivocal victory for Great Britain and her Allies. There is a Central Advisory Committee department on Women's War Employment at the Board of Trade, Whitehall Gardens, and anyone interested in promoting its objects will find it well worth while getting into communication with the Executive Chairman. It is not only a patriotic movement, but a commercial proposition in addition.

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Aircraft Insurance. An echo of the Government Insurance Scheme against aircraft risks was heard in the House last Monday when Mr. J. A. Pease, in dealing with the Post Office Vote, made a short statement in regard to the result of the policies for small sums, ranging from £25 to £75 each, which, under a special arrangement, are available for taking out at any post office in the Kingdom for a very small premium. The amount of business done under the larger scheme may well be imagined from the figures of these small policies, which have proved such a source of comfort to the many less wealthy owners of either furniture or dwellings. Policies within the range already mentioned aggregate no less than £1,600,000, taken out by 168,000 individual owners, the premiums amounting to £10,000 per annum. These figures go up to June 21st last, and from a question put by Mr. Wing—an appropriate name to be associated with anything pertaining to air work—the amount of disbursements for damage done may shortly be available. Perhaps one will then be better able to estimate whether the announcement made some little while ago by Mr. Runciman, that although he did not propose to increase the rates for this class of insurance, he thought it would not be wise to reduce them, was founded upon too conservative a margin or no. It would not, even if the fund be not drawn upon at all, perhaps, be opportune to probe this little matter too deeply, as after all, the premiums received all help to reduce taxation in other directions for paying the cost of the war, and each individual holder of a policy cannot but be thankful if he is not called upon to impinge upon the accumulated funds. "FLIGHT" will be the more pleased for both reasons, the greater balance there remains for the National Exchequer when a halt is called, by reason of the whole scheme being the creation of this journal. Our original demand in September, 1914, was for the scheme to be a National liability to compensate for all damage done by aircraft raids, or failing that view being taken by the Government, then to be made a National asset, by the inauguration of a National Insurance scheme with a low popular premium. The latter alternative was selected by the Cabinet in July, 1915. We can imagine that there is still likely to be an appreciable increase in new policies—in most cases, in all probability, when too late—as it is hardly conceivable that the "Germ Huns" will fail to make some further efforts to wreak their rage and venom upon the inhabitants of these Isles, even if only by way of expiring spasms of unsatisfied hatred. Although in that case they *might* find that—— but that is another story.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 27th ult.:—

A. Y. Maddock granted a temporary commission as Sub-Lieutenant, R.N.V.R., with seniority June 26th.

Temporary Sub-Lieut., R.N.V.R., F. G. Browne appointed as Probationary Flight Sub-Lieutenant (temporary), and appointed to "President," additional, for R.N.A.S. To date June 25th.

The following appeared among the Admiralty announcements of the 28th ult.:—

The undermentioned have been entered as Probationary Flight Sub-Lieutenants (temporary), seniority of July 2nd, and all appointed to "President," for R.N.A.S.: F. H. M. Macintyre, F. V. Branford, T. W. S. Harris, A. B. Hill, H. J. R. Maitland, W. G. Westcott, R. W. Greenwood, F. V. Hall, D. L. Wilson, H. G. Gower, P. Wood, and W. W. Wilkinson.

The following appeared among the Admiralty announcements of the 2nd inst.:—

C. T. Brimer, entered as Probationary Flight Sub-Lieutenant (temporary), seniority of June 7th, and appointed to "President," additional, for R.N.A.S.

Temporary commissions (R.N.V.R.) have been granted as follows: Lieutenant—T. A. Parker, seniority of June 30th; Sub-Lieutenants—C. F. Brightman and C. Chapman, both seniority of June 30th, and all appointed to "President," additional, for R.N.A.S.

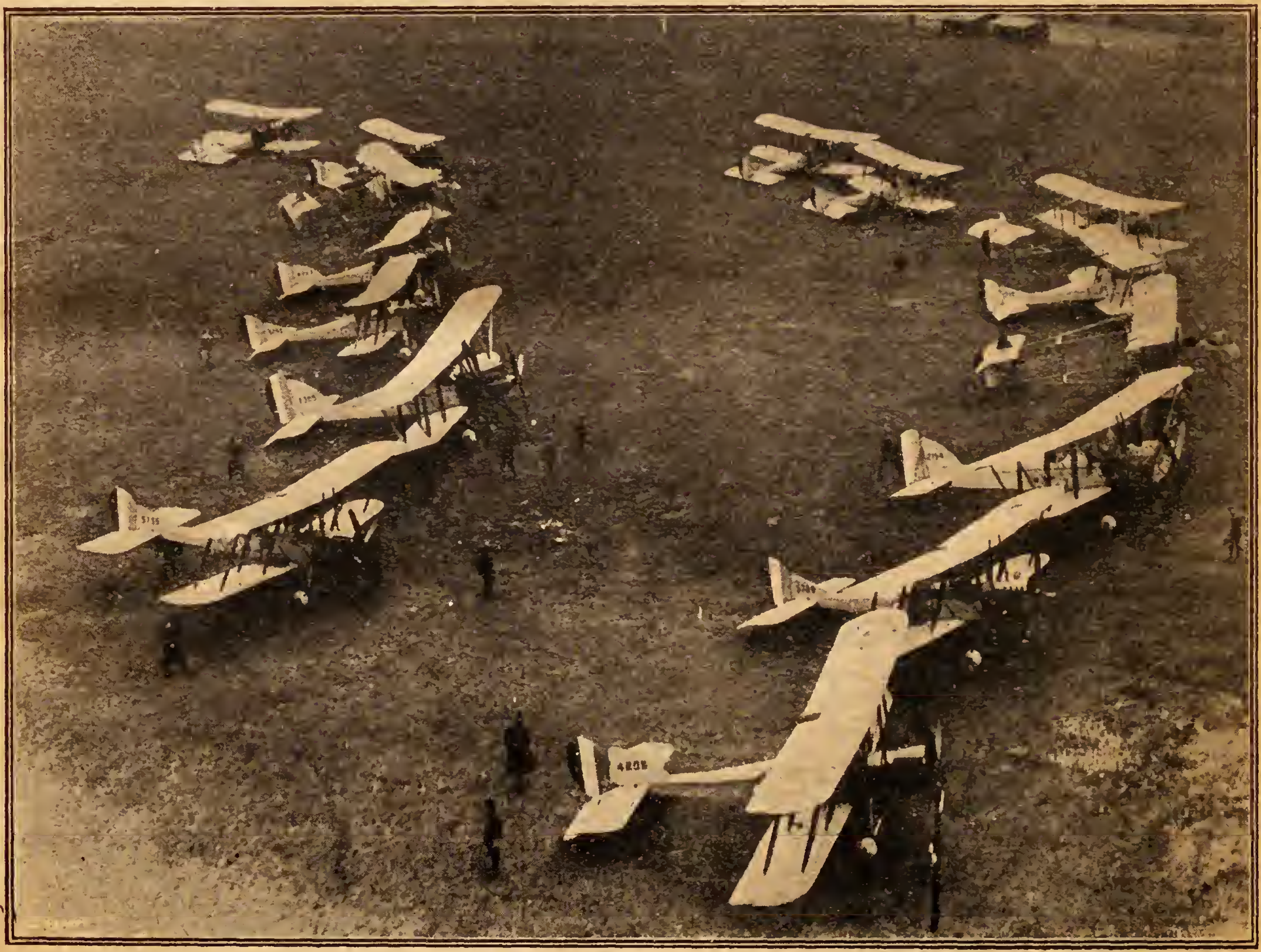
Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of the 27th ult.:—

Squadron-Commander.—Capt. J. L. Kinnear, L'pool R., from a Flight Commander, and to be Temporary Major whilst so employed; June 1st, 1916.

Flight-Commanders (from Flying Officers, and to be Temporary Captains whilst so employed).—June 1st, 1916: Temporary Second Lieut. C. H. Elliott-Smith, General List; Lieut. F. W. Stent, Special Reserve; Second Lieut. H. I. F. Yates, Special Reserve; Second Lieut. F. Hudson, Special Reserve; Second Lieut. A. W. Briggs, Special Reserve. June 10th, 1916: Temporary Lieut. A. J. Evans, General List; Lieut. L. H. T. Sloan, Cam'n. Highrs. *From Flying Officers*; June 12th, 1916: Temporary Capt. R. Burdon, General List; Second Lieut. S. Dalrymple, Special Reserve, and to be Temporary Captain whilst so employed.

Equipment Officer.—Lieut. C. W. Willcox, Special Reserve, from an Assistant Equipment Officer, and to be temporary Captain whilst so employed; June 13th, 1916.



A batch of presentation aeroplanes lined up in England ready to be flown overseas. (*Official photograph issued by the Press Bureau.*)

SMITHSONIAN INSTITUTION AUG 2 1962

Memoranda.—Brevet Major (Temporary Lieut.-Colonel) C. J. Burke, D.S.O., R. Ir. Regt., relinquishes his temporary rank; June 18th, 1916. The undermentioned to be Temporary Second Lieuts. for duty with the R.F.C.; June 17th, 1916: Corpl. Frederick Norman Insoll, from Blundell's School, O.T.C.; Corpl. Edward Rodney Wright, from 2nd Co. of Lond. Yeo. (T.F.); Lce.-Corpl. Victor John Grey Crothers, from 9th R.W. Surrey R.; Gunner Henry Forsyth Paton, from Canadian F.A.; Gunner Norman Cook McClelland, from Canadian F.A.; Gunner Robert James Warner, from Canadian F.A.; Driver Hugh Hamilton McIntosh, from Canadian F.A.; Pte. Edward Percy Charles, from Canadian Exp. Force; Pte. Eric Steadman, from Inns of Court O.T.C.; Pte. Percival Leigh, from Inns of Court O.T.C.

Supplementary to Regular Corps.—To be Second Lieutenants (on probation); May 23rd, 1916: Arthur L. Jurd, Harry A. Browne, Henry F. Blake. George Purvis-Russell-Balfour-Kinnear; May 29th, 1916. June 17th, 1916: Norman H. Colson, Thomas B. W. Spencer, Gilbert Barrett, Charles A. Mader, Charles F. Ring, Douglas J. Bell, Norman B. Lovemore, Noel Goodwin, Frederick Williams, John D. V. Holmes.

The following appeared in a supplement to the *London Gazette* issued on the 28th ult.:—

Flying Officers.—June 3rd, 1916: Temporary Lieut. J. M. M'Alery, General List, from a Flying Officer (Observer). Second Lieut. J. H. Kelly, Special Reserve. Temporary Second Lieut. B. E. Berrington, E. Kent R., and to be transferred to the General List; June 4th, 1916. Temporary Lieut. T. F. Hazell, R. Innis. Fus., and to be transferred to the General List, June 5th, 1916. June 6th, 1916: Second Lieut. C. J. Campbell, Special Reserve; Second Lieut. C. V. Hewson, Special Reserve. Second Lieut. C. H. Tayler, Ind. Army Reserve of Officers, from a Flying Officer (Observer); June 8th, 1916.

Assistant Equipment Officers.—Second Lieut. D. B. Sanders, Special Reserve; April 11th, 1916. Second Lieut. L. B. Aylen, Special Reserve; June 12th, 1916. Temporary Second Lieut. J. Kirsop, General List; June 15th, 1916.

Memoranda.—Acting Sergt.-Major William H. Bowkar to be Second Lieut. for duty with the R.F.C.; June 14th, 1916.

To be Temporary Second Lieutenants: First Class Air Mechanic John H. B. Burgess, from R.F.C., for duty with the Military Wing of that Corps, June 10th, 1916; Cadet Louis B. Solomon, from First Officer Cadet Batt., for duty with the R.F.C.; June 17th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: H. Rigby, R. N. Rowell, J. H. Kelly, C. J. Campbell, C. V. Hewson, D. B. Sanders, and L. B. Aylen. To be Second Lieutenants (on probation): John L. Luntley; May 24th, 1916. Claud D. Higgins; June 17th, 1916. Second Lieut. (on probation) James C. Burney-Cumming relinquishes his commission; June 20th, 1916.

The following appeared in a supplement to the *London Gazette* issued on the 29th ult.:—

Flight-Commander.—Lieut. J. J. Hammond, Special Reserve, from a Flying Officer, and to be Temporary Captain whilst so employed; June 13th, 1916.

Flying Officers.—Lieut. E. H. Grant, Arg. and Suth'd Highrs., from a Flying Officer (Observer); May 8th, 1916. May 23rd, 1916: Temporary Lieut. W. H. S. Garnett, General List; Temporary Second Lieut. R. H. Sievwright, R. Innis. Fus., and to be transferred to the General List; Temporary Lieut. H. T. Tizard, General List, from an Assistant Equipment Officer. May 31st, 1916: Second Lieut. B. P. G. Beanlands, Hamps. R., and to be seconded; Temp. Second Lieut. H. T. Shaw, N. Lan. R., and to be transferred to the General List; Second Lieut. W. A. Porkess, Notts. Yeo. (T.F.); Second Lieut. (on probation) J. H. Parry, E. Kent R. (Special Reserve), and to be seconded; Temporary Second Lieut. O. J. F. Scholte, Bedf. R., and to be transferred to the General List; June 5th, 1916. Second Lieut. A. Hunter, W. Rid. R., and to remain seconded; June 8th, 1916. June 9th, 1916: Temporary Capt. H. G. Kaye, Yorks. L.I., and to be transferred to the General List; Temporary Capt. R. N. Thomas, R. W. Fus., and to be transferred to the General List; Second Lieut. G. Philippi, 1st Dns. (Special Reserve); Second Lieut. T. Q. Studd, Devon R. (Special Reserve), and to be seconded; Temporary Second Lieut. S. O. Barsdale, A.S.C., and to be transferred to the General List; Second Lieut. H. Spanner, Special Reserve. June 10th, 1916: Maj. M. A. Black, 5th D.G.; Second Lieut. (Temporary Lieut.) C. J. Orde, A.S.C. (Special Reserve), from a Flying Officer (Observer); Temporary Second Lieut. H. Jackson, R. War. R., and to be transferred to the General List; Temporary Second Lieut. F. B. Sedgwick, Suff. R., and to be transferred to the General List; Second Lieut. G. Wiglesworth, Special Reserve; Second Lieut. N. C. Buckton, E. Lan. R., and to be seconded; Second Lieut. R. Holloway, Special Reserve; Second Lieut. S. W. Mann, Special Reserve; Temporary Second Lieut. B. M. Wainwright, General List.

Balloon Officers.—Capt. J. R. W. Grove, R. Dub. Fus., and to be seconded; May 8th, 1916. June 10th, 1916: Capt. F. X. Russell, R. Muns. Fus., and to be seconded; Capt. P. G. Barton, R. Fus., and to be seconded; Lieut. F. G. Stammers, R. Suss. R., and to be seconded; Temporary Second Lieut. P. Worthington, Midd'x. R., and to be transferred to the General List; Second Lieut. A. H. St. Clair, Arg. and Suth'd Highrs., and to be seconded; Temporary Second Lieut. O. L. Owen, R.A., and to be transferred to the General List; Second Lieut. (on probation), L. O'G. Whitfield, Manch. R., Special Reserve, and to be seconded. June 13th, 1916: Temporary Second Lieut. N. McN. Beaton, General List; Second Lieut. W. M. Bevan, Special Reserve; Second Lieut. F. L. W., Viscount Combermere, Special Reserve; Second Lieut. G. Gilling, Special Reserve; Second Lieut. J. H. Inskip, Special Reserve; Second Lient. H. F. Wright, Special Reserve; Temporary Second Lieut. H. E. Goody, General List; June 14th, 1916.

Assistant Equipment Officers.—The appointment of Second Lieutenant (on probation), J. M. Furnival, Special Reserve, is antedated to January 7th, 1916. June 15th, 1916: Second Lieut. H. B. FitzHerbert, Special Reserve; Temporary Second Lieut. B. F. Wood, General List; Temporary Second Lieut. J. K. Mountain, General List; Second Lieut. (on probation) A. J. M. Ross, Special Reserve.

Memoranda.—To be Temporary Second Lieutenants: Second Class Air-Mechanic Valentine St. B. Collins, from R.F.C., for duty with the Military Wing of that Corps; June 10th, 1916. First Class Air-Mechanic Nelson K. Johnson, from R.F.C., for duty with the Military Wing of that Corps; June 12th, 1916.

Supplementary to Regular Corps.—C. G. Davidson, from Lieutenant, General List, Canada, to be Captain; June 8th, 1916.

Second Lieutenants (on probation) confirmed in their rank: G. Wiglesworth, H. Spanner, R. Holloway, V. W. B. Castle, H. B. FitzHerbert.

To be Second Lieutenants (on probation); May 15th, 1916: Philip H. Smith, Murton A. Seymour.

The following appeared in a supplement to the *London Gazette* issued on the 1st inst.:—

Flight-Commander.—Capt. P. G. Barton, R. Fus., from a Balloon Officer; June 21st, 1916.

Flying Officers.—Temporary Second Lieut. S. W. Woodley, A.S.C., and to be transferred to the General List; June 1st, 1916. Second Lieut. I. M. Rodney, Dorset R., and to be seconded; June 6th, 1916. Lieut. J. A. G. de Courcy, R.A., from a Flying Officer (Observer); Lieut. H. E. Haslehurst, L'pool R., and to be seconded; Second Lieut. K. B. Lloyd, R. W. Fus., from a Flying Officer (Observer); Temporary Second Lieut. S. M. Wood, K.R. Rif. C., and to be transferred to the General List; Second Lieut. V. W. B. Castle, Special Reserve; June 10th, 1916. Second Lieut. C. Geen, Lond. R. (T.F.); June 12th, 1916. Capt. A. W. Tedder, Dorset. R., and to be seconded; Lieut. H. E. Hartney, Canadian General List; Temporary Second Lieut. P. R. Pinsent, General List; June 13th, 1916. Capt. (Temporary Major) A. C. Bolton, R. Sco. Fus., to be seconded, and to relinquish his temporary rank; June 15th, 1916.

Flying Officer (Observer).—Temporary Second Lieut. W. G. Clifford, General List; May 30th, 1916.

Memoranda.—N.C.Os. from R.F.C., to be Second Lieutenants for duty with R.F.C., Aug. 29th, 1915: Sergts. Edward L. Taylor and William W. Hart.

To be Temporary Second Lieutenant: Sergt. Stanley S. Halse, from R.F.C., for duty with the Military Wing of that Corps; June 13th, 1916.

Supplementary to Regular Corps.—The appointment of the undermentioned to be Second Lieutenants, notified in the *Gazette* of Sept. 13th, 1915, is cancelled: E. Taylor and W. Hart.

Second Lieutenant (on probation) A. N. Appleford is confirmed in his rank.

To be Second Lieutenants (on probation): Gavin Ralston; May 22nd, 1916. Richard G. Booth; June 12th, 1916. Clement H. Drabble; June 13th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 3rd:—

Flight-Commanders, from Flying Officers.—Capt. C. R. Tidswell, First Dns., June 10th, 1916; Capt. W. A. S. Rough, Bedf. R., Special Reserve, June 15th, 1916; Second Lieut. (Temporary Lieut.) F. D. Lord Doune, Sco. Horse Yeo. (T.F.), and to be Temporary Captain whilst so employed, June 16th, 1916.

Equipment Officer.—The date of the appointment of Temporary Capt. C. W. Wilcox, Special Reserve, is June 21st, 1916, and not as in the *Gazette* of June 27th, 1916.

Flying Officers.—Second Lieut. (Temporary Lieut.) G. N. Martin, Durh. L.I., Special Reserve, and to be seconded; June 10th, 1916. Second Lieut. D. C. Miller, Unattached List (T.F.), and to be transferred to the General List; and Second Lieut. J. Gilmour, Arg. and Suth'd Highrs., and to be seconded; June 12th, 1916. Temporary Lieut. S. S. Halse, General List; June 13th, 1916.

Second Lieut. G. C. Husband, Special Reserve, and Second Lieut. A. J. Mayo, Special Reserve; June 15th, 1916.

Assistant Equipment Officers.—Second Lieut. C. G. Jones, Special Reserve, from a Balloon Officer; June 5th, 1916. Second Lieut. F. A. Corbett, Special Reserve; June 9th, 1916. Second Lieut. D. Drover, Special Reserve; June 10th, 1916. Second Lieut. C. H. Collins, Special Reserve; June 16th, 1916. Temporary Second Lieut. G. F. Drudge, General List; June 17th, 1916. Second Lieut. (on probation) G. Purvis-Russell-Balfour-Kinnear, Special Reserve; June 21st, 1916.

Memoranda.—N.C.Os. and men to be Temporary Second Lieutenants for duty with the R.F.C.: Pte. James Clinkskill, from A.S.C.; May 28th, 1916. Lce.-Corpl. Edgar J. Phelps, from R. War. R., and Pte. F. J. W. Humphreys, from Sea. Highrs. (T.F.); May 29th, 1916. Corpl. George C. Twining, from A.S.C.; May 30th, 1916. Pte. J. S. Williams, from Canadian A.S.C.; May 31st, 1916. Sergt. J. M. R. Langley, from 19th Alberta Dragoons; June 2nd, 1916. Sergt. Lewis C. Chapman, from R.E. (T.F.); June 3rd, 1916. Sergt. H. V. Jerrard, from R.F.C.; June 4th, 1916. Flight-Sergt. William B. Everton, from R.F.C.; Flight-Sergt. Alfred S. Morris, from R.F.C.; 2nd Class Air-Mechanic Charles I. Sandys-Thomas, R.F.C.; June 12th, 1916. Pte. Francis E. Glass, from A.S.C.; June 11th, 1916. 1st Class Air-Mechanic Hamilton E. Hervey, from R.F.C.; June 14th, 1916.

Supplementary to Regular Corps.—To be Captains; June 1st, 1916: Lieuts. (Temporary Capts.) H. R. Nicholl, T. E. Robertson, S. A. Hebden. Lieuts. J. P. Inglefield, H. T. Musker, R. B. Bourdillon, I. O. Griffith.

Second Lieutenants (on probation) confirmed in their rank: G. C. Husband, A. J. Mayo, D. Drover, G. P. Achurch, C. H. Collins.

William Riagrose Gelston Atkins to be Second Lieutenant; June 19th, 1916.

Frank C. Craig to be Second Lieutenant (on probation); June 17th, 1916.

Central Flying School.

The following appeared in the *London Gazette* of the 27th ult.:—

Assistant Commandant (graded as Wing-Commander).—Capt. (Temporary Major) G. E. Todd, Welsh R., a Squadron-Commander, and to be Temporary Lieutenant-Colonel whilst so employed, vice Lieut. (Temporary Major) E. L. Conran, 21st Lrs.; May 21st, 1916.

Instructors.—April 1st, 1916: Lieut. (Temporary Capt.) E. O. Grenfell, R.A., a Flight Commander; Lieut. (Temporary Capt.) G. D. Hill, 7th Hrs., a Flight-Commander; Second Lieut. (Temporary Capt.) L. A. Tilney, Duke of Lanc. Own Yeo. (T.F.), a Flight Commander, from Officer in Charge of Experimental Flight; April 15th, 1916.

Officer in Charge of Experimental Flight (graded as Squadron-Commander).—Second Lieut. (temp. Capt.) L. A. Tilney, Duke of Lanc. Own Yeo. (T.F.), a Flight-Commander, vice Lieut. (Temporary Capt.) G. L. Cruikshank, D.S.O., Gord. Highrs.; March 17th, 1916.

Officer in Charge of Experimental (now Test) Flight (graded as Squadron-Cammander).—Capt. (Temporary Major) J. E. Tennant, S. Gds., a Squadron-Commander, vice Second Lieut. (Temporary Capt.) L. A. Tilney, Duke of Lanc. Own Yeo. (T.F.); April 15th, 1916.

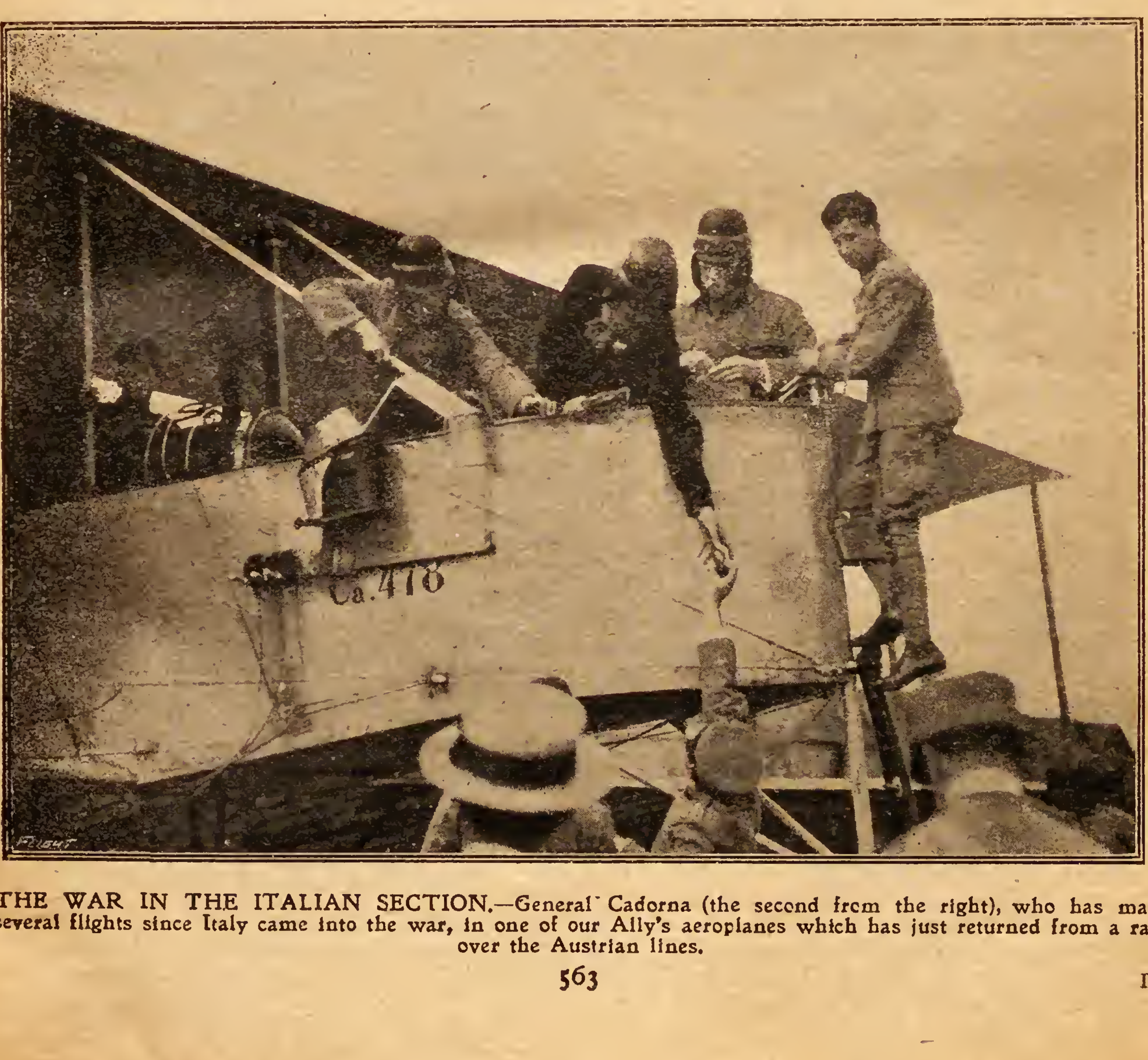
* * *

Air Work in East Africa.

Included in the list of names mentioned in the despatch, dated May 8th, 1916, of Lieut.-Gen. J. C. Smuts, for gallant and distinguished service in East Africa, are the following. The despatch is supplementary to that dealing with events in East Africa up to March 21st, extracts from which were given in our issue of June 22nd:—

Royal Flying Corps.

Temporary Captain G. S. Creed.
Temporary Lieutenant E. C. Emmett.
Temporary Lieutenant E. R. M. Griffin.
Second Lieutenant W. D. M. Bell, Special Reserve.
Second Lieutenant F. W. Brett, Special Reserve.



THE WAR IN THE ITALIAN SECTION.—General Cadorna (the second from the right), who has made several flights since Italy came into the war, in one of our Ally's aeroplanes which has just returned from a raid over the Austrian lines.

THE FLYING SERVICES FUND—ADMINISTERED BY THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to June 27th, 1916	10,739	10	8
Collected at the Westland Aircraft Works, Yeovil (Thirty-eighth contribution)	0	19	9
Staff and Workers of Gwynnes, Ltd. (Eighteenth Contribution)	8	8	11
Subscribed by the Gerrard Post Office Telephone Staff	1	1	0
Total, July 4th, 1916	10,750	0	4

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Died of Injuries (*June 29th*).

Flight-Lieutenant Geoffrey R. H. Talbot, R.N.

Injured (*June 15th*).

Flight Sub-Lieutenant Cecil H. Fitzherbert, R.N.

(*June 28th.*)

Flight-Commander Thomas A. Rainey, R.N.

(*July 2nd.*)

Flight Sub-Lieutenant Alfred M. Hughes, R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Second Lieutenant C. R. Bertram, Cavalry, Special Reserve, and R.F.C.
Captain H. A. Cooper, Royal Flying Corps.
Second Lieutenant S. G. Ridley, Royal Flying Corps.
Captain L. H. Sweet, Hampshire Regt. and R.F.C.

Died of Wounds.

Lieutenant E. H. Bird, R. Fusiliers, attached R.F.C.
7367 2nd Class Air-Mechanic F. H. F. Brand, Royal Flying Corps.

Previously Officially reported Missing, now Unofficially reported Killed.

Second Lieutenant J. R. B. Savage, Royal Flying Corps.

Died.

7789 1st Class Air-Mechanic A. J. Dell, Royal Flying Corps.
5549 2nd Class Air-Mechanic S. W. E. Dewhurst, R.F.C.

Wounded.

Second Lieutenant L. C. Angstrom, Royal Flying Corps.
Second Lieutenant J. A. Coats, Royal Flying Corps.
Second Lieutenant G. R. McCubbin, Royal Flying Corps.
Lieutenant R. C. B. Riley, Yeomanry, attached R.F.C.
Second Lieutenant S. P. Simpson, Bedford Regt. and R.F.C.

Missing.

Second Lieutenant J. L. P. Armstrong, A.S.C. and R.F.C.
Lieutenant J. R. Dennistoun, Cavalry, S.R., attached R.F.C.
Lieutenant H. B. Russell, R.F.A. and R.F.C.

Prisoners of War.

Captain D. L. Grant, London Regt.
Lieutenant S. C. T. Littlewood, L. N. Lancs. Regt. and R.F.C.

Previously Officially reported Missing, now Unofficially reported Prisoners of War.

Captain R. J. Tipton, R.F.A., attached R.F.C.
4473 Sergeant T. N. Palmer, Royal Flying Corps.
3318 2nd Class Air-Mechanic W. C. Pass, Royal Flying Corps.

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FROM THE BRITISH FLYING GROUNDS.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Straights with instructor last week: Messrs. Alty, Callard, Cockelle, Edwards, Hodgkinson, Jamie, Key, Keymer, Lyles, Mills, Mulville, Rodocanachi and Ward. Circuits with instructor: Messrs. Donald and Goodhart. Eights with instructor: Messrs. Cooper, Forster, Phillips, Turner and Welinkar.

Instructors: Messrs. Biard, Hale, Manton, Pashley, Russell, and Winter. *Brevet* Test C: Mr. Rabourdin.

Beatty School.—The following pupils were out during last week: Messrs. Kay, Glicksten, Atkin, Venables, Murdoch, Roberts, Davy, Jones, Hoskins, Earl, Skeet, Garlick, McPherson, New, Towson, Elliott, Clift, White, Austen, Rudd, Curry, Owen and Sach.

The instructors were Messrs. G. W. Beatty, G. Virgilio, A. E. Mitchell and H. Fawcett, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes.

Hall School.—Last week pupils with P. G. Allen: Messrs. Barton, Orton, Henley and Illingworth, all showing improvement. With Chas. Bell: Messrs. Cosgrave, Armitage, Smith, Halliday and Glegg, all showing exceptional progress. With C. M. Hill: Messrs. Dickson, Skinner, Jones, Deane, Le Grice, Duncan, and Worswick. Machines: Hall and Caudron (Government type) tractors.

Royal Aero Club certificates taken by Messrs. Dickson, Cosgrave, F. Smith, and Armitage, each making splendid exhibition flights.

London and Provincial Aviation Co.—Pupils rolling last week: Messrs. Mander, Bush and Leman. Doing straights: Messrs. Sivewright, Jones, Daly, Evernden and Egerton. Circuits and eights: Messrs. Whittingham and Dawson. Instructors: Messrs. W. T. Warren, M. G. Smiles, L. H. Brake, and W. T. Warren, jun.

Royal Aero Club certificates were taken by Messrs. H. J. Whittingham and A. Dawson.

Ruffy-Baumann School.—Pupils receiving instruction last week: Messrs. Babington Smith, Trubridge, Carr, Fanshawe, Durand, Williams, Fraser, Beebee, Westlake, Thomas and Holmes. Instructors: Edouard Baumann, Felix Ruffy, Ami Baumann and André Thomsen. Machines, 60 and 50 h.p. Ruffy-Baumann biplanes.

Several pupils are now ready for their certificates, and will pass the necessary tests as soon as the weather moderates.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Fenn, Montgomery, Ross, J. B. Smith, Wingfield, Little, Hinchcliff, Turner, Brandon, Green, Pritt, and Hammersley. Doing straights alone: Messrs. O. Wilson, H. Smith, Barlow, Daniel and Scaramanga. Half-circuits alone: Mr. J. Wilson. Instructors: Messrs. S. Summerfield and Bryneldsen; 35, 45, and 60 h.p. Caudrons in use.

Owing to the boisterous weather during the week flying was very difficult, but nevertheless quite a lot of pupils received tuition.

For the week ending June 18th it was omitted to state that certificate was taken by Mr. Morris.

Copyright, F. N. Birkett, from the F.N.B. Series.

A Group of Pupils who have secured their Certificates recently at the Beatty School of Flying, Hendon.—(1) Mr. J. Tjaarda, (2) Mr. A. B. Drewery, (3) Mr. C. F. Brewerton, (4) Mr. B. Gaskin, (5) Mr. R. H. Edwards, (6) Mr. G. F. Barrow, (7) Mr. R. L. D. Cuthbert, (8) Mr. R. W. Stanley, (9) Mr. G. A. Thompson, (10) Mr. M. G. Mossop, (11) Capt. H. W. G. Jones, (12) Mr. J. M. Drysdale, (13) Mr. J. d'Allesina, (14) Mr. H. L. Smith, (15) Mr. H. W. Sellars.

AN IMPROVED HANGAR DOOR.

Anyone who has had to do with the opening or closing of the average hangar door will readily admit that there is room for considerable improvement in the arrangements at present in vogue, not only as regards the energy required for the operation of so doing, but in the space occupied by the doors when open and during the process of opening and closing. An improved system of hangar doors that has just been evolved by the Aston Construction Co., Ltd., of Eagle Wharf Road, London, N., should, therefore, find a ready welcome. This system, the general arrangement of which is shown in the accompanying illustrations, has the advantages of extreme ease of operation, compactness, and reliability. In the Aston system the door is made up of a number of sections, each one folding in half and fitted with a pair of ball castors at the bottom and a pair of rollers at the top, enabling the door to trav between the guide rails with the greatest of ease. This—in itself great improvement on the ordinary sliding door fitted with pla castors, which is constantly giving trouble through the latter jam ing or jumping the guide rails—is not, however, the only featur for the free movement in any direction afforded by the ball castor and the ability of the door sections to fold, allow each section to run on the guide rails out of the way alongside the walls of th hangar in such a manner that they occupy but very little space.

The sliding of the door sections, moreover, is quite easy, an could, in the case of a moderate sized hangar, be done by one man The action can be followed readily by referring to the illustration but it should be mentioned that although the door sections give variety of movements, thereby providing a partial opening of th hangar at any section, an arrangement of stops and guards at th bends of the guide rail renders the sliding and folding back of th door sections into position alongside the walls of th hangar absolutely self-acting. The ball castor shown in detail on the large drawing of the do from which it will be seen that it is quite accessib and that it is fitted with a lubricator. Provision also made for lubricating the top rollers. It sho be noted that the ball castors and the top rollers a placed out of centre, so that the door remains stat when folded.

The number of door sections depends, of cour upon the size of the hangar, and as regards th construction we are informed that this entails no extra complicati as compared with ordinary sliding doors. It could also be adapt to existing hangars with advantage. Another feature of th Aston door is that when closed it is quite weather proof, there bein only a very small crack top and bottom, and this is screened by plate running the full length of the door.

The Aston Construction Co. will be pleased to give full par ticulars and advice in connection with the fitting of these doors o application.

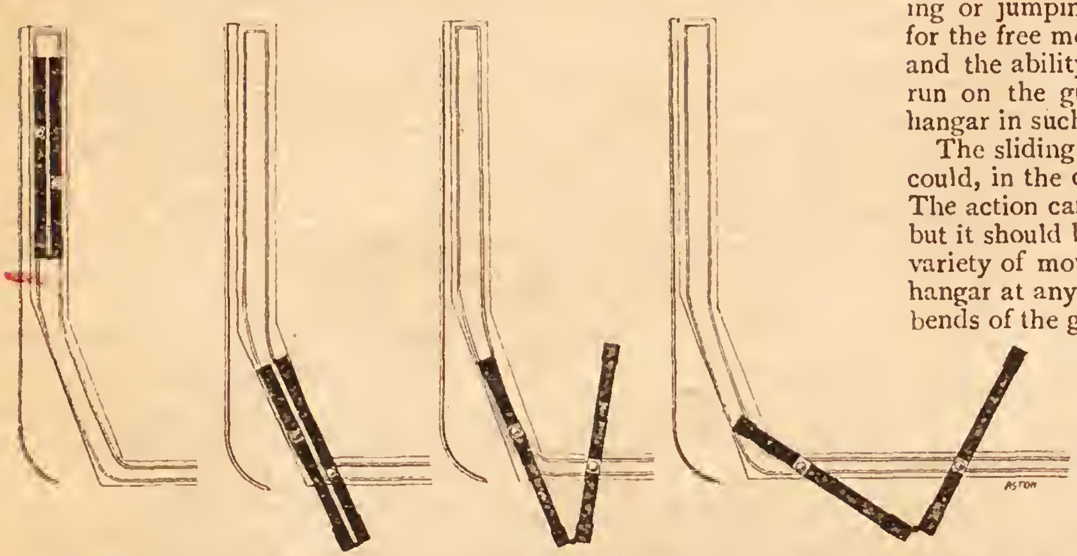
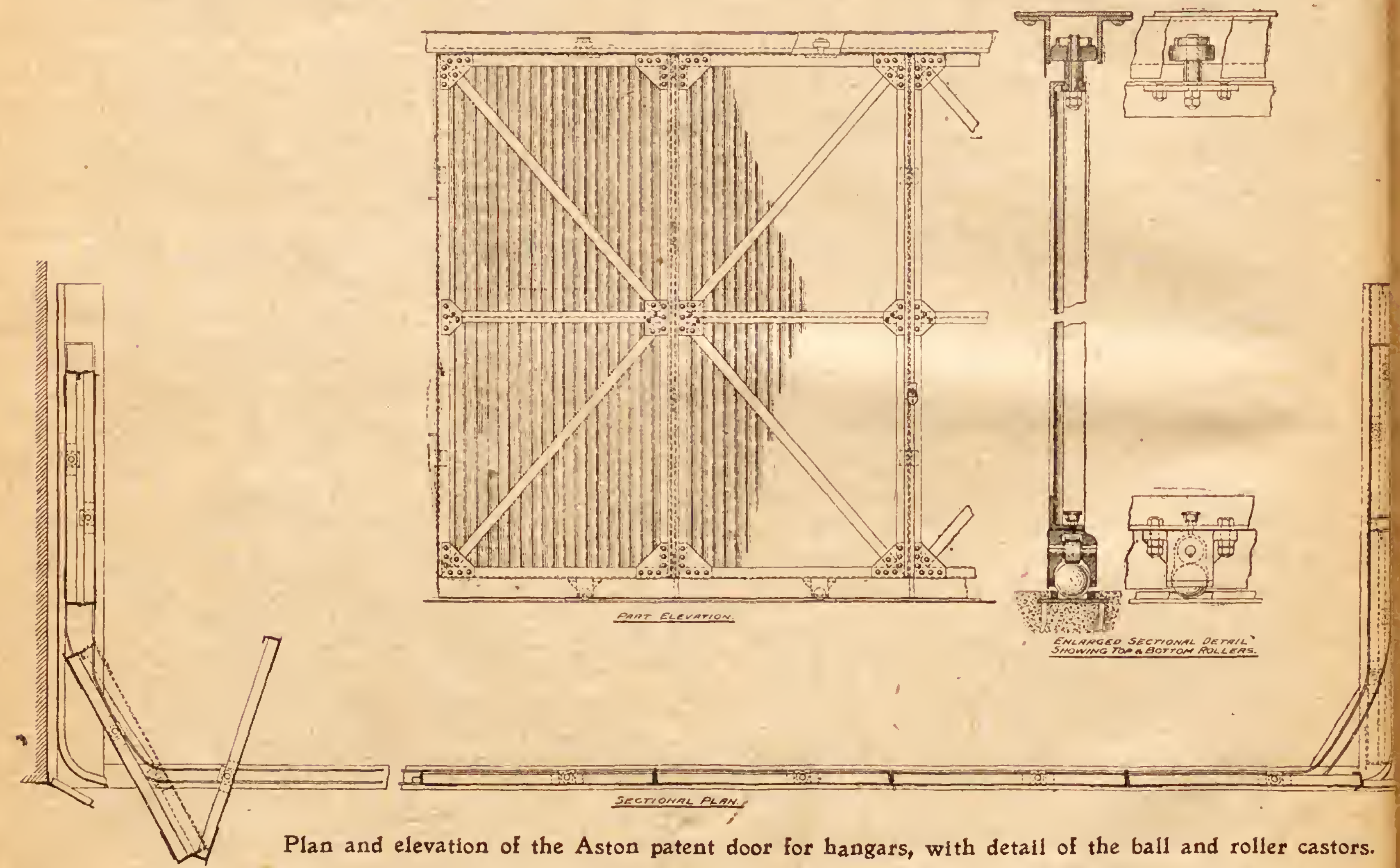


Diagram showing the positions taken by the door-sections during opening and closing of the Aston hangar door.



Plan and elevation of the Aston patent door for hangars, with detail of the ball and roller castors.

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Air Raid Warning for Theatre Audiences.

Arrangements have now been made for warnings of threatened air raids to be communicated to audiences at theatres and music halls in the London suburbs. As far as possible the warning will be given about twenty minutes before any actual attack can tak place, and those who decide to leave are warned that if bombard ment or gun-fire commences before they reach home they should a once take cover.

THE R.F.C. INQUIRY.

Mr. Pemberton Billing continued his evidence at the meeting of the Committee on June 27th.

At the commencement of the sitting Mr. Butcher asked Mr. Pemberton Billing if he was sure that the father of a killed pilot was alive on a certain date, the witness replying: "Do you think I am corresponding with the dead?"

Mr. Billing, reading from the statement by the squadron-commanders of the R.F.C. which he referred to on the previous day, repeated that the performance of the Royal Aircraft Factory's B.E. 2 C was beaten by the Germans even before the war, and now by most of the private makers in this country. He complained that he had received a letter from the Director of Air Services denying him the privilege, which was extended to many people, of visiting the aerodromes, or of having anything to do with the Royal Flying Corps. This greatly handicapped him in arriving at any decision regarding them.

Mr. Balfour Browne pointed out that the report added nothing to the weight of Mr. Billing's opinion, because the facts on which it was based were not before them.

Mr. Billing agreed, but hoped by some method the officers who had made the statement would be able to give evidence. At a meeting of manufacturers it had been decided by a majority not to appear, as they feared the consequences of such an act. Mr. Billing proceeded to read a letter from one manufacturer, but the Chairman ruled it out of order. He added: Just let me make a statement on that here and now. I can understand and sympathise with the reluctance of men or officers in the R.F.C., but so far as manufacturers are concerned it is quite different. Please accept that as final.

Mr. Billing: I am entirely in accord. I am disgusted with some of them in not taking this opportunity of placing their views before the Committee.

Dealing with the Aircraft Inspection Department, Mr. Billing produced a report by a late member of that department who was prepared to appear before the Committee. Inspectors totally without experience were engaged for their responsible posts haphazard. The pay was 35*s.* per week for viewers and £2 10*s.* for inspectors; such salaries were not likely to encourage highly-qualified men. They were employed in a purely civilian capacity and wore no uniform. Rather than employ incompetent inspectors it would be better to have no inspectors at all and put the whole onus on the constructors. The moral responsibility was to a certain extent lifted by the presence of the inspectors.

The Chairman: The inspection by Government inspectors does not remove the burden in the least degree. Contractors must fulfil their contracts. If that was the feeling in the trade, it was entirely unjustified.

Mr. Billing: My point is that a great deal of the inefficiency of machines of Government design arises from the men who designed them not having practical experience in aviation.

The Chairman: Do you suggest that there have been more faulty designs by the Royal Aircraft Factory than by private constructors?

Mr. Billing: Undoubtedly; in my opinion, yes.

The Chairman: Have you any data on which you base that opinion?

Mr. Billing repeated instances already mentioned of accidents to factory machines.

Sir Charles Parsons denied the accuracy of a statement by Mr. Billing that it was possible to design a machine, provided a designer understood his job, which "would get into any position and get out of any position in the air without collapsing."

Mr. Billing said he could prove his assertion, and instanced the case of Germans who were constantly bringing down machines by the flattening-out process and firing upwards.

Sir Charles Parsons said there was a limit to everything.

Mr. Billing said he could show Sir Charles Parsons a machine which had done some alarming things without crumpling up—flattening out in a nose dive, falling with a 110 h.p. engine going at an enormous rate, and suddenly going in a certain direction.

Sir Charles Parsons disputed the contention that it was possible to design such a perfect and reliable machine as described, but Mr. Billing said he should like to prove his point.

General Smith-Dorrien pointed out that the failures of Factory machines occurred two years ago, and that a good deal of Mr. Billing's evidence was based on his own imagination.—Mr. Billing replied that a good deal of his evidence was based on his knowledge and experience. He complained that the Committee kept him there all day, and did not give him time to get the details.

The Chairman: No. You intimated that you were willing to come before the Committee, and were given a considerable time to marshal your evidence.

Mr. Billing: You must understand I am prepared to devote nearly all my life to this work. I have other calls on my time and other duties to perform, and it is as an act of grace that I am trying to assist in the reorganisation of the Air Service. I came before this Committee very reluctantly, and I would have preferred to have appeared before a committee absolutely versed in aviation and not before those who are taking it up specially for this inquiry.

Mr. Balfour Browne: Never mind the reluctance. You are now here; you have made certain statements, and we want to find the grounds. That can only be done by evidence.

Sir Charles Parsons: We want some of the general accusations justified.

General Sir H. Smith-Dorrien: These hypothetical cases are no good to us. The greater part of your time seems to be taken up in going into long dissertations of no good.

Mr. Pemberton Billing: I should not be obliged to do it if members of the Committee had any experience in aviation.

General Smith-Dorrien: I think you think that we know much less than we do.

The Chairman pointed out that he was perfectly familiar, after 30 years of experience, with inspection in engineering works.

Sir C. Parsons: I have all my life been doing Government work, and to make a general charge against inspectors without evidence is most unjust.

Mr. Pemberton Billing: A man who was a grocer's assistant yesterday might be an inspector to-morrow.

Mr. Butcher: Have you any case of a grocer's assistant? If not, it is not a fair illustration.

Mr. Pemberton Billing: I think it is rather a good illustration. I have a report here. (Handing a paper to the Chairman.) I think the writer will come, but in case he does not I must read this document. Witnesses don't like the prospect of being called. This is taken as a kind of inquisitorial inquiry.

Mr. Balfour Browne: I protest against these remarks. You have made certain grave charges, and you have been asked to prove them. I object to all these letters and reports without witnesses.

Mr. Pemberton Billing: Shall I have the same privilege as General Henderson, and be allowed to sit at a table and examine my witnesses?

The Chairman: Certainly, you can.

The Chairman: The charge of misappropriation of public money by the falsification of time-sheets which is made in the letter you have read must be proved.

Mr. Billing: I will give you the name and address of the writer.

A gentleman here rose from among the public, and said that he was the writer and was prepared to give evidence.

This gentleman, Mr. R. F. Curtis, was called forward by the Chairman, and took Mr. Billing's place at the witness-table. He said he had been an engineer, and had spent two months at Hendon as examiner in the Aircraft Inspection Department at the Aircraft Manufacturing Company's works. Talk and killing time was the work of many of the inspectors, of whom there were 20 or 25. He was paid 50*s.* a week, and assistants were paid 35*s.* a week, with overtime. He declared that work was only done by those who cared to do it, and that anything from five to thirty degrees of inaccuracy in the machines was not rectified. He tried to alter this by referring it to the examiner in charge, but was told that it was not worth bothering about because the type was becoming obsolete.

Mr. Billing: Were the machines being finished to be destroyed or to be flown?

Mr. Curtis: They were for school purposes.

Mr. Billing was pointing out that the pilot's life was as valuable in the one case as in the other, when the Chairman remarked: "Do not tell us that two and two make four every time."

Witness went on to state that they were practically expected to falsify the time-sheets in order to get overtime money. He refused to sign for hours he had not worked. The examiner in charge, by whom the papers had to be signed, said to him: "Why have you not signed your time-sheet the same as the others?" and witness replied: "I do not quite see my way to sign for hours I have not worked." Then the examiner said: "Don't you see you are letting all the other chaps down?"

In reply to Sir David Henderson, Mr. Curtis said he had not made any report on the question of falsifying time-sheets to any person in authority, but he had sent a draft copy of his statement to Colonel Bagnall-Wild, of the Aircraft Inspection Department.

In the afternoon Mr. Billing gave technical evidence in private.

On the following morning, continuing his evidence, Mr. Billing began by saying that he wished to call attention to the circumstance that on Tuesday when he alluded to the fact that one of our new machines, F.E. 2 D., had been delivered directly into the German lines as the result of the incompetence or inexperience of the pilot, General Henderson stated that the pilot had been shot down, and consequently he refrained from any comment. But Lord Montagu of Beaulieu stated in the House of Lords on Tuesday that the pilot and observer had landed behind the German lines quite intact, and he would like to know whether General Henderson adhered to his statement that this machine was shot down.

General Henderson replied that his protest was made against the innuendo in regard to the good faith of the pilot. The machine was brought down by anti-aircraft gunfire, and he would bring evidence on the subject.

Mr. Balfour Browne : Did you notice that Lord Curzon stated that similar mistakes have been made by the Germans ?—Yes, but that is a most regrettable defence. We ought to be doing better than our enemies.

Mr. Balfour Browne pointed out that the approaches to the German and British aerodromes were very much alike.

The Chairman : In the case of a pilot who is capable of flying a machine, but who has not been to the country before, is that a mistake a fairly experienced pilot might be expected to make ?—I should say it was a mistake he ought not to make, because he was flying with maps and in the day time. It is not so much the pilot as the observer. It is the observer's job to keep a bright lookout, and if the observer had been competent the affair would not have happened. I understand that the observer had only been in the Flying Corps nine days.

Mr. Billing went on to say that some time ago the military authorities approached the Admiralty in order to borrow pilots, and when they heard they were to fly B.E. 2 C.'s the pilots refused to go, but volunteered to go with their own types. The Admiralty had quite a number of B.E. 2 C.'s and would put no difficulty in the way of the Army taking them back again. One of the naval pilots told him that, if he were starting on a bomb raid or reconnaissance over the enemy's lines, and were given a choice of machine, he would select the Sopwith "1½ strutter," with Le Rhône engine, as giving him the greatest confidence, and that he would have less confidence in the R.A.F. engines than in any other.

The witness here intimated that that concluded his evidence subject to his being able to call witnesses. He had received letters from a number of people offering to give evidence, but before he called them he was going to see them, as he had got many communications from cranks. He would like to add, however, that the changes that had taken place in the administration and command of the R.F.C. in the last few months had been, in the words of men in the Service, almost miraculous. Firms that had previously complained were now satisfied, while men who had deemed it their duty to come forward and give evidence now considered that step unnecessary. Whether critics or criticised suffered or not as the result of this investigation, he at any rate was perfectly satisfied that the outcome would be of permanent advantage to the Service and to the science to which he had devoted many years, and to which he hoped to return.

The Chairman : The most serious charge you bring is that the public air service of the Royal Flying Corps has been so blinded by faith in its own production that the air service has been mismanaged ?

Mr. Billing agreed.

The Chairman : Have you any evidence on that point ?—Yes, I think I shall be able to call two witnesses. Some witnesses were to attend, but their courage has failed them.

Mr. Billing was then cross-examined by Sir David Henderson, who first asked if the facts and figures quoted at the inquiry were those to which Mr. Billing referred on March 22nd in the House of Commons.

Mr. Billing replied : "Some of them," adding that the facts and figures were offered to Mr. Tennant or others on the Treasury Bench, for them to investigate, purely from their position in the House. The evidence he had offered consisted of dates, the names of the machines, the places of death, and the generally accepted cause of death amongst members of the Flying Corps. Beyond that he could not go.

Sir D. Henderson : These are the facts upon which you have based your charge of murder ?—The evidence upon which I said there had been negligence tantamount to murder.

That they had been murdered rather than killed ?—I have put facts and figures before Committee to the best of my ability.

You don't answer my question. These are the facts and figures upon which you based your charge of murder ?—Some of the witnesses I have been unable to call, such as service witnesses. But I don't withdraw anything from my speech so far as it relates to the military branch.

You told the House of Commons that on October 26th one of our own machines was shot down by one of our own machine guns through the stupidity of a brigadier-general. What has that to do with a charge of murder against the Flying Corps ?—I don't know all the facts.

Why is that case mentioned when it has nothing to do with the Flying Corps ?—In my opinion the pilot took unnecessary risks, but if this particular case does not reflect on the command it should certainly be withdrawn. I naturally dealt with all cases which reflected discredit on general maladministration, and in preparing a list of 200 cases, it is possible that one or two isolated cases may not reflect so much on the Service, while others, were the facts fully known, might reflect even more.

Don't you know there was no brigadier-general, excepting myself, in the Royal Flying Corps at that time ?—No, I didn't know.

Then why did you say so ?—Well, it goes to prove that six brigadier-generals have been made in a year. But I accept the statement that this machine was shot down by our own officers.

Why ?—From your remarks. I want to satisfy myself that the machine was, or was not, shot down.

Oh ! We shall have evidence on that.

With regard to a statement made by Mr. Billing in the House of Commons, to the effect that there were 105 cases of missing officers who, if they had had decently engined machines, would be in this country or fighting our battles in the air to-day, Sir David Henderson asked if Mr. Billing still adhered to that statement.

Mr. Billing : Possibly one might say most of those men.

Sir David Henderson : Do you adhere to the statement or do you withdraw it ?—I certainly don't withdraw it. I simply substitute the word, "most" for "all."

Sir David Henderson : I take that as a withdrawal.

Mr. Balfour Browne : You modify your statement ?—Only very mildly.

Sir David Henderson : Is it not the fact that you have not much evidence, but you want us to call the evidence ?—I do to a certain extent.

Mr. Billing was next questioned about a statement he had made that machines were being manufactured six months after the type had been condemned. He complained that Sir David Henderson was too fastidious about words, and said that what he (Mr. Billing) meant was that the machine had been discarded by the French ; that was what he meant by condemned.

Sir D. Henderson called Mr. Billing's attention to his statement in the House that in the early stages of the war we had no machine to compete against the Fokker, and as a result our men were being shot down like rabbits.

Mr. Billing adhered to the allegation.

Sir D. Henderson : Have you any evidence of it ?—No ; it was a remark made to me by pilots, and I can't improve on it.

Sir David Henderson : Would you expect the casualties on the B.E. 2 C. to be heavier than on other machines ?—You may have made mistakes in the purchase of other machines. On the question being repeated, the witness replied, "Oh, distinctly."

Sir David Henderson : You suggest that our superiority was at last due to machines borrowed from the French ?—Yes, borrowed, or bought, or secured from the French.

Questioned as to the four groups of intrigues in the R.F.C. which Mr. Billing mentioned on Friday, he said that Sir David Henderson belonged to the first group.

This group he had described as consisting of those who had carried on a long and persistent intrigue to get control of both the air services and perpetuate the principles of the R.A.F.

On the question of calling the authors of the Squadron Commanders' statement, Sir David Henderson said he could not reasonably say that it would not influence him very seriously if he knew who they were.

Regarding his allegation that there was intrigue and jealousy between the Services, and that the officers of the R.N.A.S. were not on speaking terms with the officers of the R.F.C., Mr. Billing said that a few weeks ago he was in Paris at the British Air Headquarters. The military occupied the first floor and the naval the second floor. He asked a naval officer, who was a friend of his, to take him to the floor below to see a military officer with regard to obtaining a permit to see the sheds and flying, and the naval officer replied, "Not on your life, no."

The names of the naval and military officers in Paris were shown to Mr. Billing, who replied that the officer to whom he spoke was one of them. Mr. Billing understood that the officers were not on speaking terms.

The Chairman : Is that the evidence on which you base your charge that the naval and military representatives in Paris are not on speaking terms ?—Yes ; Major Courtney told me point blank he had "not time" for one of the other officers whom he mentioned.

Sir D. Henderson, with the permission of the Chairman, then read the following telegram from Paris :—

"With regard to Pemberton Billing's statement *re* relations between aviation officers in Paris, we wish to state that as regards the present staff the statement is absolutely without foundation.—(Signed) Capt. Acton, R.N., Major Courtney, R.N.A.S., Capt. Lord Innes-Ker, R.F.C."

Mr. Billing: Has that been sent with spontaneity on the part of those gentlemen?

Sir D. Henderson: That is so.

Mr. Billing: Most interesting. Perhaps we shall be able to refer to that later on.

Sir D. Henderson: His objection to take you down to see Captain Innes-Ker was that you were in his company?—No, I should not think so.

Sir D. Henderson: I should have no doubt about it—Capt. Innes-Ker would only be one of hundreds who are not allowed to be seen in my presence. They have been given orders—or shall I say instructions—which they tell me came from you, that they are not to be seen speaking to me.

Sir D. Henderson: Let me understand. Do you suggest there have been orders issued?—Officers who are personal friends of mine have distinctly told me that they have been given the word, I cannot say whether it was typewritten or private notice, that if they are seen speaking to me their number is up! Do you follow?

Sir D. Henderson: I understand what you say.—That they are frightened also to appear before you here.

Sir D. Henderson: You suggest I have given an order?—I suggest that measures have been taken in the direction indicated, and that during the last two months friends of mine in the Flying Corps have shown by their conduct that they must not speak to me. I have met them in various clubs and other places, and on one occasion one said: "For God's sake don't speak to me, or my number is up."

Sir D. Henderson: I want you to be more specific. Where did they get their orders from?

Witness: Well, where do you think? It certainly did not come from someone not interested in the Flying Corps.

In further examination Sir David Henderson remarked: "When you are challenged——"

Mr. Pemberton Billing: Challenged! Anyone would think you were asking questions for the benefit of the newspapers.

Referring to Mr. Billing's speech in the House in which he asked members to picture the position of an observer whose pilot was shot, Sir David Henderson quoted the words, "He hears a gasp and a cry, turns round, and sees that the pilot is dead."

"I don't like speaking about this sort of thing," said Sir David Henderson, "but it rather shows the type of the whole speech. Does Mr. Billing know any type of machine on which an observer would be able to hear a gasp or a cry?"

Mr. Billing said the pilot might have stopped his engine or have been planing down and the whistling of the wires might have been reduced. If a man were shot through the head or lungs he would gasp fairly loudly. He had no experience of that kind, but if Sir David cared to go with him in a B.E. 2 C. he would stop the engine and gasp, and see if Sir David heard him.

Sir D. Henderson: You further said, "These cursed, groggy machines."—And I stick to it. I should curse them and I think they are groggy. Alluding to his statement that pilots had been driven into the air, he said he was in the habit of using service slang and they talked of "driving into the air." While he might alter a phrase in his speeches in the House he adhered to the sense of what he had said.

Sir D. Henderson: On the question of inefficiency, you spoke about "the blind and unreasoning faith" of the chief of the Royal Flying Corps. Have you any knowledge at all about the relations of myself and the chief of the Aircraft Factory?—Only from your subordinates.

You mean officers of the Flying Corps?—Yes.

Are they likely to have any knowledge?—I think so, because one arrives at these conclusions from results.

Sir D. Henderson closely questioned Mr. Billing as to the report he had mentioned regarding airships, which was a confidential document of the Committee of Imperial Defence, and his statement that Sir David Henderson was one of the experts who had opposed the construction of rigid airships before the war. Mr. Billing admitted he had never seen the report.

Sir D. Henderson: Then on what grounds do you make the charge?—Do you deny it?

I am cross-examining you now, not giving evidence.—I shall cross-examine you on that point later on.

The Committee will see the reports you refer to. I tell you now that the whole thing from beginning to end is purely your imagination or your own invention.—It is extraordinary that the imagination of a number of witnesses should run along the same lines.

The Chairman: We have had no evidence of that.

You have produced no witnesses.—I was speaking of what the witnesses have said who preceded me in this chair.

Sir David Henderson remarked that he had great difficulty in ascertaining what was surmise, imagination, and evidence on Mr. Billing's part.—At any rate I don't withdraw anything. The statements I have made were not reckless statements in any way.

Mr. Billing had complained that officers in command of the air service had had no active service in the air, and General Sir D. Henderson was one of those officers.

Sir David Henderson asked Mr. Billing if there were not other commanding officers who had had active service.

Mr. Billing replied that he should want their names to see whether he considered that they had had active service.

Sir D. Henderson said he had not had active service in the air, and the Committee would be given the full reasons why he had been placed at the head of the service. He complained that Mr. Billing had confused inspectors with examiners in the inspection department. An air service inspector held the rank of officer. He asked if the things which Mr. Billing had told the Committee were to be taken in any way as expert evidence. Frequently Mr. Billing made the qualification "from his knowledge," "from his experience," and "it was his opinion" of such and such a thing. Was that expert evidence?

The Chairman: I am not sorry you asked that question, because it seems to me clearly that not a single piece of the evidence Mr. Billing has given could be accepted at any trial or in any court of justice as evidence. All that it amounts to is this: he has given and made statements about information that he has gathered in the course of his inquiries into these matters, and the value, and the only value, of Mr. Billing's statement is this: He has directed our attention to various matters which he has told us are wrong, and he desires us to inquire into them. Of evidence there is practically, from first to last, no piece of evidence at all. That is how the matter stands.

Mr. Billing: I never expected, once the Royal Naval Air Service was ruled out of the scope of the inquiry, to be of any service to the Committee except as a guide and councillor to make suggestions.

Sir D. Henderson: If the Committee consider Mr. Billing's evidence is expert evidence, I should like to ask him *in camera* one or two questions.

The Chairman: I have regarded him as an expert on certain questions that I have asked him.

The inquiry was resumed on the 29th ult., when Mr. Billing was examined by Mr. Charles Bright.

Mr. Bright: Has not any shortage of aeroplanes at the front been due to a great extent to a shortage of first-class pilots available for the front?—I think that there has been a shortage of pilots, directly due to maladministration in training.

Were not high-power engines specially required when we made clear the practical uses to which aeroplanes could be turned?—They were, and those of us who were far-seeing advocated them in the very early days. The Navy was fully in favour of high-power engines, but General Henderson, representing the Army, was absolutely against them to the best of my knowledge and belief.

Sir David Henderson asked if the grotesque statements which Mr. Billing was making were part of his evidence, because, if so, he would have to call evidence to combat it.

The Chairman: Undoubtedly they are part of his evidence, and we will tell you what evidence we desire you to bring.

Mr. Bright asked witness if he would agree that our machines had not flown more times on the average than the German machines.—Well, we only have the German official report to help us as to the percentage, and I am not inclined to believe our enemy's communication always.

Mr. Bright read an extract from a recent report by Sir Douglas Haig, in which the British Commander-in-Chief stated that the enemy's activity in the air had been mainly confined to his own side of the line, and in interrupting the work carried out by our Flying Corps.

"Yes," replied Mr. Billing, "that reflects on the intelligence of those in command of the German Flying Corps. They have chosen their own battle ground, and that has been to the detriment of our own men and machines."

Mr. Bright: Do you agree that our aircraft have crossed the German lines more often than the Germans have crossed ours?—Undoubtedly; and providing I could persuade my enemy to fly over my country I should do so.

Mr. Bright: We have taken more legitimate war risks than Germany?—Well, yes. Well, no. Do you mean air risks or war risks?

Mr. Bright: War risks.—Undoubtedly we have taken more risks than Germany throughout the whole campaign. We have been obliged to do it. That reflects directly to the discredit of the administration. I don't like to have to admit it.

Mr. Bright asked Mr. Billing if he could corroborate some figures to the effect that in four months 240 air combats took place, in which the R.F.C. engaged 400 or 500 hostile aeroplanes.

The Chairman: Where did you get these figures from?

Mr. Bright: Many of them are available generally. (To Mr. Billing): Have you seen the Fokker and other German aeroplanes?

—I have been denied every privilege in that direction by the R.F.C.

As an engineer, I do not think you would be impressed with their success. Out of the first 26 accidents inquired into by the Royal Aero Club Committee before the war, are you aware that only three happened to Government machines?

The witness did not reply to this question. He said that at the outbreak of war he was satisfied that the supply of engines would be one of the greatest troubles.

Mr. Billing expressed the opinion that we had got better men. He went on to say that at the outbreak of war he was satisfied that engine trouble would be one of our greatest difficulties.

Mr. Bright asked was it not fortunate that when war broke out we should have ready a design enabling firms who had never hitherto built aeroplanes to undertake the work?—That, sir, is the tragedy of the air service—that orders have been given for out-of-date machines to firms not used to making aeroplanes. He added that we had 50 h.p. machines and the highest speed attained was sixty to sixty-two miles an hour. Within seven days of the outbreak of war he personally designed a higher speed machine, and within another seven days not only were the drawings finished, but the machine was in the air and had broken all records.

Mr. Bright: It was all ready?—It was all ready, and flying at Brooklands.

Mr. Butcher said that before the war a great many people foresaw neither the probability of war nor its magnitude. These included responsible politicians and others.

Mr. Billing: I have no good word for them, or I will say for people usurping the position of statesmen.

Complaining of the country's lack of foresight, Mr. Billing said that with ordinary horse sense we could have bought a Zeppelin eight years ago and copied it.

Mr. Bright: As a patriotic pilgrim in the House of Commons and throughout the country you have come here to substantiate what you have said elsewhere, as well as to assist us in our inquiry?—I should not think of coming here to substantiate anything I had said elsewhere. I came here to help you with my experience and knowledge, such as they are, to effect reforms. There was no question of clearing my character. I never bother about that.

Mr. Bright: And our duty has been to test your allegations?—Not to test my allegations, but to decide the best methods of making the necessary inquiries.

Mr. Bright: How were you aware of the questions that would be asked?—By intelligent anticipation and the trend of events.

How did you acquire so many reports from officers?—Mr. Billing dived into a big tin box which he had by his side, and said: "By foresight and vision, Mr. Bright."

You say your charges against the air service have been robbed by the fact that you have not been allowed to deal with the naval wing of the air service?—Sure.

The naval air service is infinitely worse than the land air service?—Oh, infinitely.

Then your description of the De Rougemont of the land air service is mere milk and water compared with what you would describe the chief of the naval air service?—I agree with you. You know the peculiarities of Mr. De Rougemont. I always regret being personal, but I don't qualify or withdraw it. Nothing has happened here why I should do so.

Flight-Commander Farnall Thurstan, R.N.A.S., examined by Mr. Pemberton Billing, said he had been engaged in aviation since the first Rheims meeting. Before the war he represented the Bristol firm in India and many other countries. Two weeks before war broke out he was in Germany demonstrating the qualities of his firm's best machine—the Bristol Bullet. He got the machine away, but drawings were now in possession of an Austrian Government-subsidised firm in Vienna. He was now Admiralty representative on the Aircraft Board of Survey, a post suggested by himself. The board was instituted recently to ensure that competent people were in flying stations at home and abroad, and that no machines not up to war service remained in commission.

He was for nearly a year in Paris buying materials for the Royal Naval Air Service, and the relations between himself and Captain Valentine, who was there on a similar mission for the Royal Flying Corps, were distinctly bad. They did not work in harmony or co-operate in any way; in fact, they were in competition, each trying to get the most supplies for his own service. The competition, however, did not relate to prices, which were fixed by the French Government. There was nothing personal at first, but eventually the relations became so bad that they were the subject of comment in official circles in Paris, and Captain Hodge, the British naval and, he understood, military attaché, made them the subject of a report. From a conference he attended in Paris, when Sir David Henderson was present, the impression he got was that he was not expected to be on particularly amiable terms with the military branch because they were trying to secure a monopoly of the French output, and he was told by his superior officers that he was "to keep his end up." He had been promoted, although he had only been in the service a few weeks, in order that he might be put on an equality with Captain Valentine. The friction had now largely been removed, and he believed some effort was now being made for the two branches to co-operate. If the French had not helped our flying services we should have been in a terrible position, and he still considered that the deficiency in our air service was due to ignorance, short-sightedness, and crass stupidity.

Mr. Billing (to witness): Do you consider that the critics on the air service are justified in their attacks?

The Chairman: No, no.

Mr. Billing: That is a point I want to make, and I am asking his opinion on it.

The Chairman: You are asking him to tell you what we are here to decide.

Asked by Mr. Billing as to whether his inside knowledge of the R.F.C. six months ago suggested to him that reforms were necessary, witness replied that it did, because in the progress of aviation everything possible should be done to bring everybody into line. As the result of this lack of enterprise, endeavour, and encouragement, many of our best constructors stopped inventing altogether.

The Chairman remarked that in peace time it was not to be expected that aeroplanes would be turned out in large numbers when they were not wanted.

Mr. Billing: Would you say that we should stop building ships for the Navy?

The Chairman: I am not giving evidence.

Mr. Pemberton Billing: You made a statement which left me rather troubled.

Mr. Billing: Do you know that naval pilots have refused to fly Army machines in France?—No; I know nothing about it; it is only rumour.

General Sir H. Smith-Dorrien; Do you believe that naval pilots have refused?—I know nothing about the incident.

General Smith-Dorrien: You make rather sweeping charges of inefficiency against the responsible heads of the R.F.C. Am I to understand that these charges relate to absence of foresight and imagination in making sufficient provision for the eventualities of a big war?—Yes, sir.

Do they refer at all to inefficiency in any other capacity?—No.

You do not suggest that they were unequal to their command in any other respect?—No, sir. I see nothing but from one point of view—that of aviation.

Commander Thurstan said pilots generally considered that the Royal Aircraft Factory's B.E. 2 C. two-seater was "a good machine when there was nothing else to be had."

Mr. Balfour Browne: In your opinion which is the best machine?—I should say the best all-round machine to-day is the Sopwith "1½ strutter," and the second best the Nieuport.

To the Chairman: He had pointed out the success of the Nieuport in January, 1915. The Admiralty took it up in March, and the War Office some time after that. He did not suggest inefficiency on the part of the responsible heads of the R.F.C., except in respect of want of foresight in making adequate provision for a big war. He added that although both Services went to the same firms in Paris, and bid against each other, it was not in prices, because in the majority of cases the French Government had fixed prices themselves. There was a battle between the two branches as to who should get the best stuff. He agreed that the Sopwith "1½ strutter" had only been available very recently. The later types of Nieuport were not really available yet, and the best Farmans were only available in the spring of 1915.

Sir David Henderson asked witness what he meant by "keeping his end up" when representing the R.N.A.S. in Paris. "You said that Captain Valentine received similar instructions. Have you any personal knowledge of such instructions?"—No, sir.

The witness, in reply to the Chairman, stated that the machine with which Lieutenant Warneford destroyed a Zeppelin near Ghent, and for which he was awarded the V.C., was a French machine. The lieutenant told him that he would never have accomplished the destruction of the German airship unless he had been using that particular machine.

In reply to questions put by the Chairman on behalf of Captain Goldney, M.P., he said that he had heard that the Nieuport had been refused by the War Office for the reason that no commission was paid. Cross-examined by Sir David Henderson, he said that he supposed that the commission would be paid to the military representative in Paris.

Sir David Henderson: I am going to call Captain Valentine.

The Chairman thanked the witness, who withdrew.

Captain Bennett Goldney, M.P., recalled, read a statement pointing out the difficulty of getting junior officers to come forward and give evidence for fear of the consequences.

General Henderson had stated that the suggestion that such officers would be victimised was an insult to the Flying Corps, but he added that he would not be responsible for what his brother officers would think. In the junior branch of the service that was regarded as a threat, but Mr. Goldney said that he would nevertheless take upon himself the responsibility of calling a number of officers to corroborate the statements he had made.

He suggested that the Chairman should receive statements from such officers, satisfy himself as to their *bona fides*, but that their names should not be disclosed to the air administration.

Sir David Henderson said that he had no objection to officers in the R.F.C. writing to the Chairman.

Manufacturers, with one exception, had invariably refused to give evidence, saying that they feared they would be stranded without further orders. The attempt to make the R.A.F. the master of the Air Service instead of its servant was the cause of the failure.

The Chairman, in intimating that the Committee would sit *in camera*, said that they wished to discuss the question of the difficulty of getting pilots to give evidence. "I have expressed the opinion once, and do so again," added Mr. Justice Bailhache, "that the difficulties which manufacturers profess to feel leave me quite cold."

At the resumption of the public sittings of the Committee on July 3rd, General Sir David Henderson was in the witness chair, and said that several personal charges had been made against him, and he wished to wipe them off first.

"One of those charges," he said, "was that I was the head of a group which had determined to obtain control of the whole air services, both naval and military, and that I have been working for that end. I wish to state that I undertook the charge of the Royal Flying Corps most unwillingly, and it was not until it was proved to me that it was my duty to subordinate my personal feelings to the public service that I undertook to assume my present position. In order to do this I had to relinquish the office of director of military training at Headquarters Staff, which I much preferred to hold."

Mr. Balfour Browne: When did you do that?—"In 1909. Since that time I have on several occasions urged that I should be replaced by a younger officer, and one more in touch with the practical aspects of flights, but I could not succeed in persuading the Army Council to agree with me in this view. It has been alleged, at this inquiry and elsewhere, that in 1912 I opposed the construction of airships for this country, and it has been suggested that it was mainly owing to my position that airships were not built. That charge is based on extracts from two reports of the sub-committee of the Committee of Imperial Defence held in that year. I have obtained permission of the Prime Minister that the two reports of the sub-committees of 1912 should be laid before this Committee. The first of these reports dealt mainly with aeroplanes and the second with airships. From these reports this Committee will be able to judge as to the accuracy of the charges made."

Sir David handed the reports to the Chairman, remarking, "They are both secret documents."

The Chairman: By some means or other one does not seem to have been as secret as it ought to have been.

Mr. Balfour Browne: Do these reports contradict the allegation that has been made against you?—These reports disprove it entirely.

Dealing with the assertion that owing to his opposition big engines for the R.F.C. were not developed, Sir David said that in 1913 manufacturers were asked to take part in an engine competition, under the auspices of the Admiralty and the War Office. The lowest horse-power permitted was ninety, and there was a large number of entries of British-built engines.

Sir David then admitted a serious mistake. That year, he said, the Royal Aircraft Factory had begun to design an engine of 200 h.p. In view of the large number of entries received for the engine competition, he considered that the position as regards the supply of engines of high power in the country was more or less safe, and he stopped work on the Royal Aircraft design. There was no question that he was wrong in his decision, for the designs were still unfinished at the outbreak of war.

Another charge was that the Royal Flying Corps Factory was, simultaneously, competitor and judge, and that the selection of aeroplanes had been from the beginning entirely in the hands of the Royal Aircraft Factory. Sir David emphatically denied the allegation, and declared that the factory since early in 1912 had not been consulted in regard to the selection of air machines. He had stopped the building of a certain R.A.F. scout which had been in use for 4½ months because Sopwith and other better machines could be obtained from private makers. The B.E. 2 C was sufficiently proved before the war to justify ordering in quantities. It had been very materially improved in the last six months. Of private designs now in use, the de Havilland scout had been undertaken by the Aircraft Manufacturing Co. at his request.

Sir David Henderson went on to deal with fatal accidents in this country, presenting a return of such accidents since the B.E. 2 machine came into existence.

Mr. Pemberton Billing interposed: "Does 'peace' flying include flying against Zeppelins at night?"

"Yes," was the reply. "We can understand the anxiety to include flying against Zeppelins at night because no other machine could be used."

The machines possessed by this country at the outbreak of war, and the reasons why they were rendered obsolete, were dealt with in detail by the witness. He stated that the B.E. 2 C. had been materially improved within the last six months.

The Chairman: We have been told that the B.E. 2 C. as it exists to-day is very materially better than it was, and that is due to comparatively recent alterations.

Sir David: There have been considerable alterations.

With regard to fighting in the air and allusions made to certain machines being unprepared to defend themselves, went on Sir David, there were certain documents called R.F.C. *communiqués* issued by the R.F.C. headquarters, and they were for the information of officers generally. In these *communiqués* special attention was paid to fighting in the air and giving accounts of various fights for the information of pilots who did not take part.

"I went through them myself, and afterwards had the numbers checked to find out which types of our aeroplanes had been most successful in bringing down Germans. The number of Germans brought down between certain dates were in proportion as follows:—

B.E. 2 (of various types)	16	Morane...	4
F.E.	9	De Havilland	3
Vickers...	7	Nieuport	2
Bristol Scout	5		

He would explain the meaning of these figures in private, as also at what cost these successes had been obtained.

The Chairman: Are you able to draw any inference from that as to which is the most successful machine? I daresay you are not, because you require to know what they are engaged on.

Sir David: The least dangerous work is fighting in a fighting machine. I think any pilot who has been engaged both in reconnaissances and artillery observation, or gone up on a purely fighting expedition, or has been bombing, would say that in fighting in a fighting machine there would be probably less casualties than in any other branch of the air service.

The next criticism dealt with was that aeroplanes and engines were so bad that the machines could not be lifted out of range of gun fire.

Sir David Henderson quoted the heights at which machines had been hit varying from 12,000 ft. to 14,000 ft. The height at which shells had been observed to burst was from 14,000 ft. to 15,000 ft. One lieutenant had a fuse of a German anti-aircraft shell marked 7,500 metres (23,125 ft.). At 20,000 ft. he did not think the Germans would be likely to waste much ammunition on aeroplanes.

The Chairman: None of these officers were killed by these shells?—No.

Nor were they brought down?—They were hit, but not brought down.

Sir David said that an officer flying at 14,500 ft. had said that he had observed a shell burst 1,000 ft. above him.

"I am rather wondering," said the Chairman, "at what height anti-aircraft guns are really effective. I know pilots have been brought down from a great height."

Mr. Balfour Browne: What would a pilot be doing at 14,000 ft.?—Waiting for a German, or he might have been on a journey.

Mr. Billing asked why these figures were being given in public.

The Chairman said the charge had been made that pilots had been "murdered" because they could not fly high enough. The figures given showed that machines had been hit even after they got to a very great height.

Mr. Billing made no reply.

Dealing with engines, Sir David said that assistance, both technical and financial, had been frequently given to manufacturers. In reply to the Chairman, he admitted that practically all the machines in this country at the outbreak of war were fitted with engines not of British design. The winner of the engine competition was a 100 h.p. Green. He would give in private the reasons why it was not adopted.

As regards the R.A.F. 90 h.p. engine, the Officer Commanding the 5th Wing in Egypt had reported 18 failures, an average of 1 in 110 hours' flying. In two of these cases there was no petrol in the tanks, in others the failure was attributed to the carelessness of a mechanic or to the breaking of wires.

In answer to Mr. Billing, the Chairman said that the answers to all specific charges which had been made in public would be given in public.

Mr. Bright asked if it was only the horse-power of an engine that prevented us getting to Essen.

Sir David replied that there were other reasons. The designing of a large aeroplane was a much more complicated matter than the designing of a small one. It might be stated generally that none of the large aeroplanes designed by any country was satisfactory. Every country was still making strenuous efforts to solve the problem, and we were not by any means behindhand.

Such machines would have to be accompanied by fighting machines, and there was the difficult problem of ensuring that they did not become separated.

Mr. Balfour Browne: You cannot keep your destroyers in touch with your Dreadnoughts?—It is very difficult.

The Chairman: Mr. Joynson-Hicks put it that we ought to be able to stop the Zeppelins from starting, but this is also a question of distance. How far do you think it would be reasonable in the present state of aeronautics to expect an aeroplane to be able to go in order to destroy Zeppelin sheds and to return to our lines on a *calm day?*

Sir David: There are now in existence and in our possession aeroplanes which would be able to go to certain of the Zeppelin sheds and come back again in reasonable weather.

Sir David dealt exhaustively with the *personnel* of the Flying Corps, the system of promotion, &c.

"Will you deal with the fault of too many officers?" the Chairman asked. "It has been stated that this is a branch of the Army in which all are colonels and there are no privates."

Sir David refuted the suggestion that officers were appointed who had no knowledge of flying. The British service was unique in that the executive of the Flying Corps was confined to officers who had qualified as military pilots.

The Chairman: Two cases of improper promotion have been referred to, and it has been said that this is an army in which everybody is a colonel and nobody is a private.

Sir David promised to deal with that charge in private.

Sir David Henderson: In reference to the specific cases of "murder or criminal negligence," I have been accused in an unpleasant way of laughing at the details of hypothetical occurrences in the air. Since then I have had numerous anonymous letters on the subject, accusing me of utter heartlessness, and I would like to state definitely——

The Chairman: It is as well in the circumstances. I, too, have had quite a number of letters.

Mr. Pemberton Billing: So have I.

Sir David Henderson referred to Mr. Billing's speech of March 28th, as quoted by Mr. Billing.

"I should like any hon. member to picture himself in a machine absolutely alone, walled in by wires, with a pilot somewhere behind . . . He is sitting there helpless at 11,000 ft., the machine diving and sheering in all directions, and knows that the moment will very soon come when she will get into a nose dive and he will crash 11,000 ft. and be smashed to pieces simply because of the foolish folly of these officials who do not understand and will not be taught that dual control in such a machine would have saved that man's life."

It is a very serious accusation against me, continued Sir David, that I smiled at the reading of this extract. What I smiled at was the omission of the sentence—"he hears a gasp and a cry and turns round and sees that his pilot is dead." For a person who claims to have a knowledge of aeroplanes to make a rhetorical remark like that—well, one may be excused for smiling in such circumstances. I won't go into the matter deeper.

The Chairman: We have had this thrashed out before.—I may tell the Committee that my only son has been for $3\frac{1}{2}$ months flying at the front on a B.E., my nephew is flying a B.E., my wife's nephew is also flying another Government machine, and I have several cousins flying another type. I naturally feel rather deeply about it.

Mr. Billing: Will you tell the Committee why you smiled?—Because it is untrue, or impossible.

In regard to the accusation that a pilot was allowed to fly over the Channel in a worn-out machine, he said that the technical officer who examined the machine and saw the pilot start would give evidence.

In another case where bombs carried on an aeroplane exploded, the opinion among the squadron was that the pilot, in his desire to get rid of the bombs before landing, misjudged his distance from the earth, and both he and the mechanic were involved in the explosions. Another view was that the bombs blew up when the machine landed.

Sir David Henderson went into Mr. Busk's death at Farnborough, in reference to which Mr. Billing had read a letter purporting to come from Mr. Busk's father. He had reason to believe that Mr. Busk's father had been dead for at least 10 years. The Court of Inquiry that was held was unable to find out the cause of the airman's death, but added that it was probably due to a leak of petrol combined with a backfire through the carburettor.

Mr. Billing remarked that he had submitted the original letter he had received to the Chairman.

In the case of Captain W. Lawrence, whose Bleriot machine broke during a nose-dive, Sir David said that Captain Lawrence's theory as to bombing was to fly to a great height, dive, flatten out, release his bombs, and climb out of danger. The objective of his attack was well guarded by anti-aircraft guns. At some point of the dive the machine broke. He believed that the captain came down with his engine on for 3,000 ft. at least.

Sir David told Mr. Billing that if a machine was once supposed to be unsafe the type was immediately discarded. This type of Bleriot was discarded soon after—not because of the accident, but because the machine was too slow.

The report of the Court of Inquiry into the accident in which Lieut. Tennant was involved was read by General Henderson. Capt. Jones was the passenger, and the machine was fitted with dual control. The report of the Court was that the pilot committed an error of judgment in attempting to turn at too low an altitude.

The case of Lieutenant Littlewood, who descended in the German lines at Lille, was next referred to. In a letter to his father Lieutenant Littlewood said that from Boulogne he was not certain of his location, "for the map I was provided with was rotten, and not correct." When about four miles over what he thought was St. Omer, Lieutenant Littlewood stated that anti-aircraft guns began to fire at them, and some shrapnel struck their planes. Thinking it was our own gunners firing at them in error, he made a hasty descent. When about 500 ft. up the engine gave out, "and we landed into some telegraph wires, which smashed up the machine, but neither of us was injured."

Captain Grant, his observer, in a letter to his wife, wrote:—

"By all the rules of the game I, who was sitting at the front, should have been killed. Instead, I made a hole in a turnip field and got up cursing our gunners for firing at us. I got up and had the surprise of my life to find that they were Germans."

Mr. Billing suggested that had the pilot had a good map probably he would have landed in our lines.—I have no knowledge of what map he had, and I have had no complaints from pilots about the maps they are supplied with.

Mr. Billing: Do you say there is no one to blame for delivering this valuable machine to the Germans?—I have not said that no one is to blame, but I do not admit it until I know something more about the affair.

The Committee again adjourned until the next day.

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A Protest by Sweden.

THE Swedish Minister at Berlin has protested to the German Government because a German seaplane attacked the British steamer, "Portlock" while inside Swedish territorial waters.

German Motor Company's Profits.

THE Benz Company of Mannheim, one of Germany's largest motor manufacturers, earned net profits of £600,000 in 1915-16, which was more than twice its heaviest peace-time earnings. It declared a 20 per cent. dividend for the year, compared with 12 per cent. in the year before the war.

Austrian Troops Fed by Aeroplanes.

ACCORDING to a correspondent of the *Corriere d'Italia*, two regiments of Jaegers, finding themselves besieged in the Frenzela Valley, are being furnished with food from aeroplanes.

A Double Fatality in Kent.

WHILE starting off from a south coast aerodrome on his retur to France on June 29th, Flight-Lieut. G. R. Talbot, R.N.A.S. was killed through the machine side-slipping soon after leaving th ground. An air-mechanic who was accompanying him was al killed.

Pilot Killed in Motor Cycle Accident.

A VERDICT of "Accidental death" was returned at an inques relative to the death of Norman Vivian de Beer, R.N.A.S. H came from South Africa, and a few days before death had obtained his pilot's certificate. On June 22nd while riding a motor cycl in Edgware Road, he came into collision with a motor car and wa thrown through the wind screen. The driver of the car wa exonerated.

BRITISH AIR WORK.

The following second *résumé* of incidents extracted from recent reports of the Royal Flying Corps in France has been issued by the Air Board :—

May 31.—A British reconnaissance was attacked by three Fokkers when in the neighbourhood of Cambrai. The enemy were first seen diving at our machines from the rear, with the sun behind them. Our machines, which were heavily fired at, retaliated as occasion offered. Soon after the fight began one of the Fokkers was seen to turn half a loop, sideslip badly and nose-dive. It was last seen nose-diving, having apparently been hit by our fire.

One of our machines was last seen soon after the commencement of the fight ; but owing to the fact that all the machines were busily engaged in the running fight, which was of a persistent nature, its fate was not observed. About the same time, however, Lieutenant C., pilot of one of our machines, reports that a machine, apparently out of control, dived over him, almost touching his top plane, and disappeared, no more being seen of it. The two remaining Fokkers pursued our reconnaissance, one breaking off the fight or else being compelled to descend before reaching the lines, while the third followed until within the zone of the advanced German anti-aircraft guns.

June 1.—Lieutenant D., with Lieutenant E., while on artillery duty, attacked a hostile machine near Laventie. Fire was opened at about 300 yards, but at this moment Lieutenant D. was attacked by a Fokker from above and behind. The Fokker dived to within forty yards, when Lieutenant D. swerved slightly to avoid the enemy's fire. Lieutenant E. then attacked the Fokker at point-blank range. The Fokker banked over to the left, and something which looked like a box fell out. The machine then nose-dived, and was last seen spiralling down close to earth. From other sources it is reported that the Fokker was seen to fall to earth at the north-east corner of Bois de Biez.

A kite balloon was carried away by a sudden gust, the cable running off the winch, at 7.25 p.m. The occupants both made parachute descents, landing safely. Lieutenant F. helped Lieutenant G. before descending himself, and consequently landed close to the trenches. Hostile machine-guns opened fire on him, but he escaped unhurt. The balloon drifted over the German lines.

June 8th.—Lieutenant H. and Lieutenant J. directed a battery on to a train at Salome. Six direct hits resulted, and the train was set on fire, and was seen to be still burning one hour and a half later.

Lieutenant K. and Captain L. ranged a battery on to a railway station. Large explosions were seen in a shed, which was totally demolished.

June 10th.—Lieutenant K. and Captain L., in a machine, when on artillery duty, saw a Fokker flying over the enemy's trenches. They followed the German for about 1½ miles in the direction of Lille, where he turned to attack. Our officers opened fire at a range of about 50 yards. When level with the tail of our machine the enemy turned sharply and dived, and was further fired at as he turned. He dived more steeply, and was observed by Lieut. K. to crash to earth in a field near Haubourdin.

June 17th.—Lieutenant M. and Lieutenant N. left their aerodrome at about 12.45 p.m. to intercept a hostile reconnaissance. Eight hostile machines were observed at 7,500 ft., appproaching from the direction of Doullens. The British machine flew towards them, and when almost directly underneath, Lieutenant N. opened fire. The British machine then turned, and when at about 400 ft. below the German formation, opened fire into one of the tail machines. A few minutes later, this machine was seen to glide down, and passing low over the trenches, land just north of Bois de Biez. Lieutenant M. now endeavoured to cut off the main body of hostile machines. In this he failed, but succeeded in catching the last hostile machine, just over the trenches at 6,000 ft. When within 100 yards the German dived steeply, followed by our machine firing at about fifty yards range. The enemy observer appeared to be out of action, as no reply was made to our fire. Lieutenant M. continued the pursuit until within 2,500 ft. of the ground, when the German was seen to land in a field about a mile north-east of Achiet le Petit. Our machine recrossed the trenches at 2,500 ft.

Altogether there were thirty combats in the air on this day.

June 18th.—Two machines, Pilots Captain O. and Lieutenant P., Observers Lieutenant Q. and Sergeant R., working together, encountered two Fokkers east of Lens at 4.15 p.m. at about 9,000 ft. The machines chased the Fokkers down, diving steeply in small circles, and firing all the time. Captain O. being short of petrol left his opponent diving vertically at about 2,500 ft. The other Fokker was shot down by Sergeant R., and fell to earth from 4,000 ft.

Lieutenants S. and T., No. 3 Squadron, engaged and dispersed a column of infantry in Martinpuch with machine-gun fire.

A machine, Pilot Lieutenant U. and Observer Corporal V., when patrolling over Annay at about nine p.m., attacked three Fokkers seen behind the enemy's lines. One of the latter went off. The remaining two made for Lens, towards another British machine, which they attacked. Lieutenant U. followed and joined in the fight, diving on to one of the attacking Fokkers, which turned away, and dived perpendicularly. It was seen by an anti-aircraft battery to fall to the ground. When Lieutenant U. turned again the other British machine and Fokker had disappeared. This British machine is missing, and is reported to have landed in the enemy's lines.

Captain Y., on a Nieuport, and Lieutenant Z., on a de Havilland, engaged a hostile reconnaissance of six machines in the neighbourhood of Arras, driving one down, near Terre Mesnil, east of Doullens, where it landed on its left wing, the pilot and observer being captured. One of them was slightly wounded.

The following account of the incident which occasioned the death of Lieutenant Immelmann is furnished by the Air Board :—

"On June 18th last one of our F.E. aeroplanes, whilst patrolling over Annay, at about 9 p.m., attacked three Fokkers. One immediately retired, whilst the other two turned towards Lens and proceeded to attack another F.E. which was then approaching from that direction.

"The first-mentioned F.E. (Pilot Lieutenant McC., observer Corporal W.) followed and joined in the fray, and, diving steeply on one of the attacking Fokkers, caused it to plunge perpendicularly to the ground. It was seen to fall to earth by one of our anti-aircraft batteries.

"A subsequent report from another machine in the neighbourhood states that the Fokker went to pieces in the air and both wings broke off. Extracts from the German newspapers relating to the death of Lieutenant Immelmann make it clear that the pilot received his death as outlined above."

AIRCRAFT WORK AT THE FRONT.

British. *General Headquarters (France), June 27th.*

"Yesterday in the air numerous hostile aircraft were encountered on the enemy's side of the line. Five of our machines engaged four Fokkers, two of which were brought down and fell out of control. Two more of the enemy's machines were driven down in the course of the day. Our casualties, one machine missing."

General Headquarters, June 28th.

"Bad weather yesterday prevented much flying."

General Headquarters, June 30th.

"The weather yesterday was unfavourable for aerial work. As a result of one of the few combats in the air an enemy aeroplane was driven to the ground with a damaged engine. The Germans' heavy artillery has been in action during the day on the front between Souchez and Hohenzollern and also about Oitztje."

General Headquarters, July 1st.

"Yesterday, in spite of a high wind, a large amount of successful work was done in the air. An important railway depôt was attacked with powerful bombs, and a large number of other bombs were dropped on depôts, railway junctions, batteries, trenches, and other points of military importance in the enemy's lines.

"Considerable aerial activity has taken place to-day during the battle, but full details have not yet been collected.

"Our machines attacked a railway train on the line between Douai and Cambrai. One of our airmen descended to below 900 ft. and succeeded in dropping a bomb on one of the trucks, which exploded. Other pilots saw the whole train in flames and heard further explosions."

General Headquarters, July 2nd.

"Yesterday our aeroplanes were very active in co-operation with our attack north of the Somme, and afforded valuable assistance to our operations. Numerous enemy headquarters and railway centres were attacked with bombs. In one of these raids our escorting aeroplanes were attacked by twenty Fokkers, which were driven off. Two enemy machines were seen to crash to earth and were destroyed.

"Some long-distance reconnaissances were carried out, in spite of numerous attempts by enemy machines to frustrate the enterprises. Three of our aeroplanes are missing. Our kite balloons were in the air the whole day."

General Headquarters, July 3rd, 2.30 p.m.

"A very large amount of work was done by our aircraft yesterday. In the early part of the day several attempts at offensive action on our side of the line were made by hostile aircraft in large parties. All these were driven back, and subsequently the enemy's aircraft were held far behind the German lines, with the result that our artillery machines were able to do their work without interruption from hostile aircraft.

"During the day a very large number of aerial combats took place over the enemy's lines. Six hostile machines are known to have been brought down, and five others driven down severely damaged. Seven of our machines are missing."

General Headquarters, July 3rd, 10.43 *p.m.*

"Yesterday there was a marked increase in the number of hostile aeroplanes on the southern sectors of our front, but in spite of this our airmen carried out in a most gallant manner all the duties assigned to them.

"To-day one hostile kite balloon was destroyed by us and fell in flames. Since the commencement of the battle we have lost a total of 15 machines along the whole of the British front."

French. *Paris, June 27th. Afternoon.*

"In Belgium, in the course of a reconnaissance, three of our fighting machines fired 65 shells on German vessels near the Belgian coast."

Paris, June 27th.

"A German radiogram reports the terrible effects of the shelling of the town of Karlsruhe on the 22nd inst. by French aviators. Two hundred and fifty-seven persons were either killed or wounded, and the said radiogram denounces the 'villany of the said shelling of an open town without any military objective.'

"It is perhaps well to mention that the bombing of Karlsruhe was ordered, as was announced in the French *communiqué* issued on the evening of the 22nd inst., as reprisals for the recent bombardment of the open towns of Bar-le-Duc and Lunéville, which caused numerous innocent people to lose their lives. France has decided to resort to reprisals upon the enemy who respects none of the laws of warfare.

"This decision has been arrived at only after a number of outrages had been committed by the Germans. From February 3rd, 1916, to May 19th, 1916, during which period the French had refrained from shelling towns behind the enemy's front, the Germans have shelled Béthune six times, Amiens six times, Hazlebrouck three times, Bar-le-Duc twice, Epernay four times, Fiemes three times, St. Dié thirteen times—by long-range guns and aeroplanes—Gerardmer five times, Lunéville nine times, Baccarat five times, Raon l'Etape five times, &c.

"France has sufficiently shown to the world by her long patience her desire to keep the horrors of war from the civilian population, but, forced by Germany to change her attitude, she has resolved in future to regulate her conduct by that of Germany."

Paris, July 1st. Evening.

"During the night of June 29th–30th a group of our aeroplanes carried out the following bombardments: Eighteen shells of 120 mm. were dropped on the station of Nesles; six of 120 mm. on Roye, where a fire broke out; two on a motor convoy to the north of Nesles. These were seen falling in the midst of the wagons.

"The same night thirteen of our aeroplanes threw sixty bombs on a German munition work in the environs of Noyon. The mark was hit by a large part of the projectiles, and their effects were observed. During the night of June 30th–July 1st seven of our aeroplanes again threw thirteen bombs on the station of Nesles and the level crossing, and six bombs on the adjoining military establishment, where a fire was observed.

"In the course of a reconnaissance one of our pilots, attacked by a Fokker and wounded at the first onset, succeeded in felling his adversary, who fell in the forest of Besanges. On his return the same pilot was again attacked by an enemy biplane and wounded a second time. He succeeded in escaping and returning to our lines."

Paris, July 2nd. Evening.

"Our aeroplanes set fire to three captive balloons in the region of Verdun. Sergeant Chainat felled his fifth German machine, which crashed to earth near Peronne. During the night of July 1st–2nd one of our air squadrons dropped forty-eight bombs on the station of Longuyon, eight on the station of Thionville, and sixteen on the station of Dun. Another squadron dropped thirty-three bombs on the station of Brieulles.

"In broad daytime, on the 2nd, twelve of our aeroplanes bombarded the station of Amagne Lucquy. Sixty bombs struck the buildings and railway lines. A train was destroyed.

"About three o'clock this morning a squadron of enemy aeroplanes dropped several bombs on the open town of Lunéville. Note was taken of this act with a view to reprisals."

Paris, July 3rd. Afternoon.

"During the artillery action preparatory to the offensive, our aviators set fire to thirteen captive German balloons, and two during the day of July 1st. During the attack our pursuing aeroplanes were masters of the situation, only nine enemy aeroplanes putting in an appearance, not one of which crossed our lines. One of the enemy machines was destroyed."

Russian. *Petrograd, June 27th.*

"In the region of Mesvitche, south-west of Lutsk, an Austrian aeroplane was brought down by our artillery. The airman and observer were wounded and captured.

"In the Baltic Sea on Monday, in the Irben Strait (Gulf o Riga), three of our seaplanes engaged four German machines. One enemy seaplane was brought down and fell in the water. In spite of the attempts of the enemy to save this machine it was bombed and sank. Our seaplanes returned undamaged."

Petrograd, June 28th.

"Enemy aeroplanes are making frequent raids on our lines. They dropped 68 bombs during a nocturnal raid on the town Dvinsk yesterday. The damage both to property and life was insignificant. Two petrol tanks were burned."

Petrograd, June 30th.

"Yesterday morning enemy aviators dropped thirty bombs on Luzk."

Petrograd, July 2nd.

"A Turkish aeroplane flew over Erzrum."

Petrograd, July 3rd.

"On the right wing, in the region of Riga, our land and sea artillery bombarded the enemy's lines. An enemy aeroplane dropped unsuccessfully twenty bombs upon our ships. Attacked by our seaplanes, it disappeared."

Italian. *Rome, June 27th.*

"Nothing of importance took place on the remainder of the front. One of our air squadrons, consisting of ten machines, yesterday dropped fifty heavy bombs on Calliano railway station, in the Lagarina valley. Satisfactory results were observed, and the machines returned safely. This morning an Austrian aeroplane was brought down in an air fight about Verona."

Rome, June 29th.

"This morning two hostile aeroplanes dropped some bombs on Udine. One of these fell on the civil hospital, killing two women and wounding one. No other damage was done."

Rome, June 30th.

"Hostile aeroplanes dropped bombs on Brescia and Bassano causing one casualty and slight damage. Our Caproni aeroplanes bombarded enemy encampments in the Upper Assa valley, and returned safely.

"On Wednesday evening our seaplanes and torpedo-boats while making a reconnaissance in the Gulf of Trieste were ineffectively attacked by the shore batteries and by two groups of enemy seaplanes. The latter fled hastily as soon as they were counter-attacked at close quarters by our chasing aeroplanes.

"There is reason to believe that the enemy machines were repeatedly hit. All our aerial and naval units returned in safety t their bases."

Rome, July 2nd.

"Enemy aircraft dropped bombs on Marostica, and on various places in the low Isonzo region: none killed and the damage was very slight."

Rome, July 3rd.

"Our aircraft made raids on the Upper Assa Valley and returned safely."

German. *Berlin, June 27th.*

"Numerous bombs were dropped on the railway goods station at Dvinsk.

"A British biplane was shot down in an air fight south-east o Arras. The occupants, who were wounded, were made prisoners."

Berlin, June 28th.

"On June 25th, Lieut. Hoehndorf put out of action his seventh enemy aeroplane near Rancourt. The machine in question was a French biplane. An enemy airman was shot down near Douaumont.

"It has been ascertained on further inquiry that the particulars given in the report for June 23rd, stating that among the attackers on Karlsruhe there were some English prisoners is incorrect. All the prisoners made on that occasion were French."

"On Monday one of our naval aeroplanes, which became engaged with five Russian aeroplanes at the western entrance of the Gulf o Riga, forced one of them to land. In the course of another air fight in the same sector between five German and five Russian aeroplanes two enemy machines were forced to land, badly damaged. Owing to damage to her propeller one of our war machines came down on the water and sank. Her crew were picked up by another German machine and brought back to port. Though our aeroplanes were heavily bombarded by enemy destroyers they returned with all their pilots and observers unhurt."

Berlin, June 30th.

"Captain Boelcke, on Tuesday evening, shot down his 19th enemy aeroplane near the farm of Thiaumont. Lieutenant Barschau yesterday shot down his fifth enemy aeroplane north of Péronne (Somme). Near Boureuilles, in the Argonne, a French biplane was brought down by our anti-aircraft fire."

Berlin, July 1st.

"The Kaiser has conferred the Ordre Pour le Mérite on Lieutenant Wintgens, in appreciation of his splendid achievement in the air fight yesterday, when he shot down a French biplane south-west of Château-Salins. Near Bras an enemy aeroplane was brought down by gunfire, and another was put out of action by machine-gun fire near the work of Thiaumont. An attack by an enemy air squadron against Lille caused no military damage, but considerable casualties among civilians, especially in the church of Saint Sauveur, where over fifty persons were killed or wounded. Many French inhabitants were killed or wounded by air attacks and French and British artillery fire at Douai, Bapaume, Peronne, and Mesle."

Berlin, July 2nd.

"The enemy's aerial service displayed great activity. Our squadrons gave battle at various points and inflicted heavy losses upon him. For instance, in the region of the front attacked and that of the Meuse 15 enemy aeroplanes were shot down, eight British and three French falling within our lines.

"First Lieutenant Baron von Althaus has put out of action his seventh opponent. We lost no aeroplanes, but some pilots or observers were wounded."

Berlin, July 3rd.

"In the numerous aerial engagements fought during yesterday six enemy aviators were brought down, four of whom fell within our lines. Lieutenant Mulzer has thereby put his seventh, Lieutenant Parschau his sixth opponent out of action. An enemy biplane was brought down over Douai, and another the day before yesterday to the east of Pervyse (Ypres front), by our anti-aircraft guns. Two French captive balloons were shot down by our aviators in the neighbourhood of Verdun.

"Russian torpedo boats and the ship of the line 'Slava' bombarded the Courland coast to the east of Raggasem without result.

"They were effectively caught by our coastal batteries, and attacked by our aeroplane squadrons. The 'Slava' was struck."

Turkish. *Constantinople, July 1st.*

"*Caucasian Front.*—In the centre an enemy airman, fearing the attacks of airmen sent up against him, was forced to land."

Bulgarian. *Sofia, June 27th.*

"On the 26th enemy airmen unsuccessfully bombarded the village of Merzentzi."

From Other Sources.

According to a report from Amsterdam on June 23rd:—

"Sounds of heavy gunfire were heard on the previous morning coming from the direction of the German island of Borkum. Some hours afterwards a Zeppelin was sighted proceeding from Emden to Borkum."

The *Daily Telegraph* correspondent in Paris, writing on June 23rd, says:—

"The story of Nungesser, a French aviator, is probably unique, even in this war. When hostilities broke out he was a Hussar of twenty-two. On September 3rd, during the retreat from Charleroi, he was mentioned in despatches for having captured a German motor car, put the German officers occupying it *hors de combat*, brought back the car and valuable papers which it contained under enemy fire, and, finally, placed his commanding officer, who was wounded, under shelter. The car was a French Mors, stolen by the Germans, and after that Nungesser used to be called the Mors Hussar. Some time after that, driving the same car, he passed some old soldiers, who said: 'Why is this youth a mere motor-driver, while we are in the trenches?'

"Thereupon Nungesser refused to be a motorist any more. He became an aviator. He took part in fifty-three bombardments, and was thrice, as aviator, mentioned in despatches. But in an aerodrome, while testing a new machine, he met with an accident, had his jaw broken, and sustained a wound in the skull and broken ribs. He remained five days unconscious. When he came out of hospital he was finally invalided, but this made him angry. He used influence, went back to the front in an aeroplane, and in one week brought down two enemy machines and one 'sausage.' Then he was promoted sub-lieutenant. His latest feat was to fight against six enemies—three Fokkers and three L.V.G.'s. He saved himself by a brilliant idea. He dashed right among his enemies, who stopped firing for fear of shooting one another. The Frenchman came back safe, with twenty-eight shots through his aeroplane, seven in the motor, one bullet through his shoe, and another through his helmet."

Mr. Philip Gibbs, writing to the *Daily Telegraph* on June 27th, with the British armies, says:—

"The weather has not been good for our gunners, and their observations may have been a little hindered by the rain-clouds which have obscured the view. But to-day it seemed to me that we had the better means of observation. Immediately in front of where I stood I counted twelve of our kite balloons poised above the lines, so that the observers in their hanging baskets could see far across the enemy's trenches to his battery positions.

"Time was when I used to see 'German sausages,' as we call those balloons, staring down at us, so that one was conscious of unpleasant observation when one took a motor car over exposed ground. To-day there was not a single hostile balloon opposite those twelve of ours. The rapid destruction of six of them has, I fancy, caused the hauling down of others. If they cannot put them up again the enemy has lost the eyes of his artillery in places where he is not on high ground, from which observations may be made more safely."

Mr. W. Beach Thomas, writing to the *Daily Mail* from British headquarters in France on June 27th, says:—

"In one district south of Arras the German heavy artillery has been used very generously in reply, but wherever I have watched the duel it has been one-sided in more ways than one. We have profited by a dozen pairs of eyes to one. I refer to the kite balloons, which are the bitterest enemy to the artillery.

"Our new means of destruction have put such fear into the enemy that for the moment you may count at least six on our side to one on the other. The other day when I was in Arras the proportion was reversed. Of course, in this war no point of technical superiority lasts long; and the German is a quick imitator; but for the moment we lead."

The *Times* special correspondent at the British headquarters, writing on Saturday, says:—

"Other things also were in the air. Immediately behind us overhead hung one of our uncouth kite balloons, bathed in sunshine and stretching far away to right and left one could see a line of them marking the direction of the front. And in and out our aeroplanes moved continuously. One squadron of six together sailed splendidly and insolently straight over the German lines and far beyond. Other single machines patrolled unwearyingly up and down, perfect testimony to the supremacy which we have indisputably asserted in the air along all our front."

The *Daily Telegraph* special correspondent, on Saturday evening, says:—

"In the northern area Lille station was successfully bombed by a flight of our aviators, who, on returning, were attacked by twenty Fokkers, two of which they drove down in flames, all the British machines returning.

"It is noteworthy that very few enemy machines were seen in the air this afternoon. Many raids continue to be made by ours in the northern part of the line."

Mr. Philip Gibbs, in his despatch to the *Daily Telegraph*, describing Saturday's fighting, says:—

"Along the roads towards the battlefields there was no movement of troops. For a few miles there were quiet fields, where cattle grazed, and where the wheat grew green and tall in the white mist. The larks were singing high in the first glinting sunshine of the day above the haze. And another kind of bird came soaring overhead. It was one of our monoplanes, which flew steadily towards the lines, a herald of the battle. In distant hollows there were masses of limber, and artillery horses hobbled in lines.

"The battle-line came into view, the long sweep of country stretching southwards to the Somme. Above the lines beyond Bray, looking towards the German trenches, was a great cluster of kite balloons. They were poised very high, held steady by the air pockets on their ropes, and their baskets where the artillery observers sit, among the rays of the sun. I counted 17 of them, the largest group that has ever been seen along our front; but I could see no enemy balloons opposite them. It seemed that we had more eyes than they, but to-day they have been staring out of the veil of the mist. . . . .

"Over my head came a flight of six aeroplanes, led by a single monoplane, which steered steadily towards the enemy. The sky was deeply blue above them, and when the sun caught their wings they were as beautiful and delicate as butterflies. But they were carrying death with them, and were out to bomb the enemy's batteries and to drop their explosives into masses of men behind the

German lines. Further away a German plane was up. Our anti-aircraft guns were searching for him with their shells, which dotted the sky with snowballs."

Mr. W. Beach Thomas, in his description in the *Daily Mail* of the fight, says :—

"It must also be understood that the struggle was on three planes, below the ground, on it, and above it. To give just one local instance, a deep mine, packed with many tons of the highest explosive known to science, was blown up near La Boiselle (east of Albert) by our miners, who had tunnelled to astonishing depths. At the other extreme our towering aircraft had succeeded by the end of the morning in driving off every visible enemy from 'the layers of the upper air' in the neighbourhood of the battle ; and scores of our great kite (sausage) balloons hung like clothes on an invisible washing line, at a commanding level along all the battle front. I counted exactly twenty-two to my right, and could not detect a single German with the strongest glasses. . . .

"One after another our balloons had risen to the full height of their tether in a long line stretching quite out of sight. Their kite-tails streamed to the eastward, advertising the arrival of a good, steady west wind about to blow Heaven knows what fumes and smoke and dust and ashes from the front to the back trenches of the enemy's first line. But as yet the observers could look clear into the cockpit of battle : into the village of Fricourt, into Serée, into Beaumont-Hamel, where every leaf had been blown from the shattered trees by our fire, and every shelter and dug-out was a mangled mess.

"The highest thing I saw in the place was one ten-foot wall or so ; and the trenches running into it looked like the first shale-tips of a deserted mine. And our Army had yet better eyes than the balloons. Right over my head, against the clear background of a fleecy layer of cloud, a whole squadron of our aeroplanes, almost cloud high, but pencilled in marvellous distinctness against the cirrus flakes, flew as the crow flies, direct for their target. Argus-eyed and with more than a Cyclops voice they saw and shouted back the news of the guns' precision, untouched by the monstrous tumult below. They left the dappled puffs of shrapnel in beaded ropes behind them, as a fish leaves bubbles, till soon I could not tell which was cloud and which was smoke."

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PERSONALS.

***UNDER** the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.*

Casualties.

Lieutenant **ERIC HINCKES BIRD**, Royal Fusiliers, attached R.F.C., who died on June 27th of wounds received in action, was the second son of the late Dr. Arthur Hinckes Bird. He was gazetted Second Lieutenant in the Royal Fusiliers at the outbreak of war.

Second Lieutenant **STEWART GORDON RIDLEY**, R.F.C., whose death is officially announced, was a son of Mr. T. W. Ridley, of Willimoteswick, Redcar. He was educated at Mr. J. Roscoe's school at Harrogate and at Oundle, where he was in the O.T.C. for three years. He left school shortly before the war, and was preparing for business, but enlisted in September, 1914, with his brother, as private in the 4th Yorkshire Regiment, and in February, 1915, received a commission in the 12th Yorkshire Regiment. He left that regiment in July for the Royal Flying Corps, and went to France in August, 1915, as an Observer. He was out for four months, and returned in December, and subsequently took his pilot's certificate. He was killed on June 15th within a few weeks of attaining the age of 20.

Captain **LEONARD HERBERT SWEET**, Hampshire Regiment and R.F.C., aged 23, who was killed in a fight with an enemy machine on June 22nd, was the youngest son of the Rev. C. F. and Mrs. Sweet, of Symondsbury Rectory, Bridport, Dorset. He was educated at Sherborne School and Sandhurst, which he entered in 1912. He obtained his commission in the 1st Hampshire Regiment in March, 1913, and was with his regiment at Le Cateau and during the subsequent retreat. He joined the Royal Flying Corps in December, 1914. In February last he was promoted Flight-Commander in the R.F.C., with the Army rank of Temporary Captain.

Flight-Lieutenant **GEOFFREY RICHARD HENRY TALBOT**, R.N.A.S., whose death is officially announced, was killed instantaneously at Dover on June 29th when starting on a flight to France. The aeroplane was caught by a gust of wind and side-slipped, and was wrecked. The mechanic accompanying him was also killed. Flight-Lieutenant Talbot, who was born in 1888, was the younger son of the Hon. Alfred Talbot, of Little Gaddesden, and grandson of the 18th Earl of Shrewsbury and Talbot. He was educated at Eton, and having a great taste for mechanics entered the service of the East Indian Railway Company. His services were given to the public for the war, and he joined the Naval Air Service, rapidly becoming an expert and steady pilot. He obtained his "Wings" in 1915, and received promotion shortly before his death. He made many flights to and from France, whence he had only returned the previous day to his death.

Married and to be Married.

Flight-Commander **OGILVY DALGLEISH**, R.N.A.S., was married at Ulverston Parish Church last Friday to Miss **SYBIL GUINEVERE BUTLER KENNEDY**, youngest daughter of Mr. Myles Kennedy, of Stone Cross, Ulverston. The bridegroom is the only son of Captain James Ogilvy Dalgleish, of Glebelands, Wokingham, and nephew of Admiral Carden.

An engagement is announced between Flight-Lieutenant **CONWAY WALTER HEATH PULFORD**, R.N., youngest son of Colonel R. R. Pulford, C.I.E., R.E., and **ELINORE MILDRED (MINDRA) NORMAN**, only daughter of Mr. G. H. Norman, M.A., of Park Lodge, Budleigh Salterton, formerly of Petergate, Tiverton, Devon.

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LEGAL INTELLIGENCE.

Zeppelin Raids and Liability for Rent.

A UNIQUE case—Barton and another *v.* Allocca—was heard in the King's Bench Division on June 30th. The plaintiffs claimed £35 as arrears of rent for Michaelmas quarter, 1915, for a ground floor shop and basement in Addle Street which was damaged by a Zeppelin bomb, while the defendant counterclaimed for loss of profit at £5 a week and further damages equivalent to the rent until the damage was made good.

Counsel for the defence intimated that plaintiffs had obtained judgment on the claim, and in delivering judgment on the counterclaim, Mr. Justice Darling said that he found that the allegation that the plaintiffs had broken their covenant to repair was not established. The premises had been damaged by a bomb, and the plaintiffs had to get permission from the authorities before they could undertake the necessary repairs, and they got that permission and did the work as soon as they could, without any undue delay. The covenant did not say that while the landlords were carrying out the structural repair the tenant should not be in any way interfered with. On the facts he found that there had been no breach of the covenant for quiet enjoyment. The counterclaim therefore failed, and there must be judgment for the plaintiffs.

The Use of the Trade Mark "Sunbeam."

AN interesting decision was given in the Chancery Division on Monday, Mr. Justice Younger issuing an order directing the Registrar of Trade Marks to proceed with the registration in clause 6 of the Trade Marks Act, 1905, of the mark "Sunbeam-Coatalen" for internal combustion engines and parts thereof for aeroplanes and all motor vehicles other than motor cycles.

The application was resisted by the Registrar on the grounds that the goods bore such a strong resemblance to those for which various "Sunbeam" marks had been registered by John Marston, Ltd., which was closely connected with the applicant, as to be calculated to deceive, and that any further splitting of the mark was highly undesirable.

His Lordship said in his opinion the businesses were quite distinct, the goods were not identical, and there had never been any confusion in the public mind. As the firm was carrying on an honest and legitimate enterprise, he should exercise his discretion in its favour and issue the order.

The Blériot Manufacturing Aircraft Co., Ltd.

UNDER the winding-up of the Blériot Manufacturing Aircraft Co., Ltd., a summary of the state of affairs has been issued by the Official Receiver, the liabilities being returned at £4,515, with an estimated surplus in assets of £86,206. The assets include cash, £41,452 ; investments in shares (War Loan), £29,100 ; a book debt, £14,242 ; unpaid calls, £5,157 ; and Deperdussin stock, £100.

The Official Receiver has also issued a report outlining the career of the company, with the main details of which, however, readers of FLIGHT are fully conversant.

AVIATION IN PARLIAMENT.

The Loss of an Aeroplane.

In the House of Lords, on June 27th, Lord Montagu of Beaulieu asked whether the Government could give any information as to the start, flight, and landing of a certain F.E.2.D. aeroplane which left Farnborough on May 31st and had not yet joined the squadrons at the front; and whether any wireless message had been received in reference to it. He said that he would not refer to the incident if anything that he intended to say would give any assistance to the enemy; but he thought the House was entitled to have the information which he sought, and also to have a pledge from the Government that steps should be taken to ensure as far as was possible that such an incident should not occur again. On the morning of June 1st the aeroplane left Farnborough to fly to France. It flew across the Channel, passed over our lines and the German lines, and descended unhurt with its pilot and observer in the German aerodrome at Lille. There is a possibility of a mistake being made in distinguishing between St. Omer and Lille, for pilots are very often guided by two canals which are to a certain extent similar, but in this case there is no question of a mistake in the two canals because, he was sorry to tell their lordships, the pilot who flew this machine had never flown to France before and had no knowledge whatever of the geography of the Front.

That is what made it a very serious incident. The pilot's name was Lieutenant Littlewood, originally of the North Lincolnshire Regiment, and the observer was Lieutenant Grant, who was gazetted as a flying officer in the R.F.C. nine days after he was in the hands of the enemy.

Lord Montagu said it would perhaps be as well if he read the following extracts from a letter from one who was at the aerodrome at Farnborough at the time the start to France was made:—

"The War Office sent down and asked for two F.E. pilots, the machines being F.E. in which the engines were placed to fly them over-seas. Owing to an error in the delivery of the message it was understood that the pilots were to fly ordinary F.E. machines, with the result that in one case an inexperienced pilot was sent. I saw the pilot, who complained that he was not an experienced F.E. pilot, also that he had never been over-seas and was not sure of the way.

"The authorities, who heard all this, took no notice of his complaints and told him to take the machine. Later a report came through that F.E. had crossed the lines at Armentières and disappeared in the direction of Lille. That evening a German wireless *communiqué* stated that the F.E. had landed intact south-west of Lille, the pilot having lost his way. [Lord Montagu said that the somewhat sarcastic German wireless message was to this effect. While informing us that the officers and machine had landed unhurt at the German aerodrome at Lille, they thanked us for the engine and plane, which, they said, would be 'most useful' to them.] Thus it will be seen that within three hours of its having been taken out of the factory our newest and latest machine was handed over intact to the Huns.

"I should think if you wrote and told —— about this he would have somebody's blood, as it is the second time our beauties at the War Office have lost a brand-new machine in the same way. When the V.E. machine was just out, the fourth or fifth we sent over to France was also sent over in charge of a chap who had only just got his wings (flying certificate), and who also didn't know the way, and he landed right on the Lille aerodrome, and handed his machine to the Huns."

Lord Montagu put three questions to the Government:—

Who was responsible for sending this pilot, who was obviously an inexperienced man, with one of our most valuable and latest machines?

Is it a fact that other pilots inexperienced in the geography of the western front have been sent on similar missions?

Will the Government take steps to ensure that such serious mistakes will not take place in the future?

Earl Curzon said the last questions which Lord Montagu had addressed to him were not those which appeared on the paper. To the questions on the paper he would reply. As to the incident in question, Lord Montagu was himself obviously fully acquainted with all the details. He (Lord Curzon) could only give as much information as he had been able to get from the sources available to the Government. The aeroplane to which reference had been made left England on June 1st. The German wireless of June 2nd stated that a British biplane had landed near Lille, no date being mentioned. The pilot and passenger were prisoners in the hands of the Germans. The pilot after crossing the Channel appeared to have lost his way and descended in the German lines. Such incidents had happened before and would happen again, and they were not confined to one side. They had happened to German pilots just as they had happened to our own pilots. He was not clear whether the noble lord had meant to suggest any particular inference or base on what had happened any particular charge. He believed it was true that the pilot had not gone across the Channel before, but he doubted whether it would be wise to make it the law that no machine should be taken across the Channel, even by a competent pilot, unless he had had experience of that particular route. No doubt in all those cases they would only be too glad to send in the machine a pilot who had done the same job before. But a pilot who had such qualifications might be much more valuable at the front than employed in this country to take machines over to France. This was one of the risks which had to be run in aerial warfare. In the present case we had lost a valuable machine. He could, however, give no undertaking that such incidents would not recur.

Lord Montagu said there were two other pilots available on the morning in question. At any rate that was his information from very competent sources. He would like to know why this particular man was chosen to fly over with such a valuable machine. He thought that was a very serious matter, and he was sure equally serious notice would be taken of it.

G.P.O. Ladies and Air Raids.

In his speech on the Post Office Estimates in the House of Commons, on Monday, the Postmaster-General, Mr. Joseph Pease, paid a well-deserved tribute to the female workers in connection with air raids. He said:—

"In connection with Zeppelin raids, the work of the women who have come forward voluntarily to do duty at night deserves, I think, very high praise. Hundreds of women have thus come forward. When Zeppelin raids have been anticipated, and sometimes when they have been going on, these women have come out of their homes, and even when bombs were dropping, gone to their positions in the various exchanges. They have played an important part in an organised scheme of air-raid warnings, and in gallantry and self-sacrifice they have set a good example to the whole country."

Post Office Air Raid Policies.

ANOTHER interesting point in the same speech was that the scheme organised by the late Postmaster-General in connection with insurance against Zeppelin raids found great favour with the public. Up to June 21st policies, varying from £25 to £75, to the number of 168,000 have been taken out for the insurance of property to the amount of £1,600,000, whilst the premiums paid under this insurance scheme amount to £10,000.

The Lost Aeroplane.

In connection with his statement in the House of Lords, Lord Montagu has written the following letter to Superintendent Littlewood, father of Lieutenant Littlewood:—

"It may interest you to know that at Chelsea Town Hall I publicly expressed regret at the unfortunate occurrence to your son, and also sympathy with yourself and family in your son having been made prisoner in Germany. I only say this to remove any misconception there may be on your part as to my attitude.

"In my opinion, blame for what happened should not be laid to your son, but on those who, despite his justifiable protest, despatched him to France on a machine with which he was not properly acquainted, with maps that he did not find easy to read, and without his having had sufficient experience of geography in lines in France to ascertain exactly where he was.

"I am sorry that any reflection should have been cast by some people on your son as regards his skill and patriotism, for I feel sure from what I have heard that he was a promising officer, and I hope will live many years after the war to do good work for his country."

Lord Montagu and the Air Services.

In the course of an address on aerial matters at the Chelsea Town Hall last week, Lord Montagu said that as to the inquiry into the administration of the R.F.C., it struck him as somewhat of a scandal that men like General Henderson and his able staff should be devoting a great amount of energy in defeating people possibly not worth defeating, and taking their energies away from the prosecution of their duties, which were of far more importance.

He was inclined to think that departmental jealousy, up to a point, was right in so far as it led to efficiency, but if it led in times of war to energies being devoted to quarrelling with their own people, then the departmental jealousy amounted almost to a criminal proceeding. At the present moment we had two more or less disunited air services and a good deal of jealousy, and whether it was possible to carry out a combination of two services in time of war was a very vexed question. The ideal for which they should all strive was towards making an Imperial Air Service. In future some of our finest pilots and flying machines would come from the Dominions.

THE SOCIETY OF BRITISH AIRCRAFT CONSTUCTORS.

THE first Ordinary General Meeting of the Society of British Aircraft Constructors, Ltd., was held at the Hotel Cecil on Friday, June 23rd last, the Chairman of the Society, Mr. H. White Smith, presiding. The representatives of nearly all the members of the Society were present.

The Chairman stated that there were present representatives both of the ordinary and of the associate members of the Society, and explained that the meeting was being held in accordance with the Society's articles of association, which provided that the first ordinary general meeting should be held not later than three months after incorporation. The Society was incorporated on March 29th last.

There was, the Chairman said, only one item of formal business to be transacted at that meeting, viz., the appointment of auditors for the current year, but he would take the opportunity of making a few remarks with regard to the Society's affairs which he thought would be of general interest. All the British companies and firms constructing aircraft, and practically all those constructing aero-engines, had become ordinary members of the Society, and a list of ordinary members had been sent out to every member with the notice of the meeting. Since then two further companies, viz., the Eastbourne Aviation Co., Ltd., and the Gnôme and Le Rhone Engine Co., had been elected. In addition, several firms engaged in the manufacture of important accessories, including the propeller-making firms, had been elected to associate membership. It would, no doubt, be a source of gratification to members that the Society was so fully representative of the British aircraft industry, and he might add that a considerable number of inquiries for particulars of membership had been received from firms interested in the industry, and a short prospectus—a print of which had been sent to every member—had been prepared setting out the Society's constitution and objects.

The Chairman proceeded to state that the Committee of Management, which was appointed at the last meeting of the Council to conduct the general business of the Society, had been attending to the Society's affairs closely. It had held fortnightly meetings, and a considerable amount of business had been done. He would instance, in particular, the important subject of excess profits both in connection with the Finance Act of last year and the Finance Bill of the present session, and the negotiations which were taking place with the Ministry of Munitions. These matters would be dealt with in detail at the Council meeting which was to follow the present general meeting.

The question of acceleration of output was another important matter which would be dealt with at the Council meeting, as also would the enquiries which the Special Arbitration Tribunal under the Munitions of War Act of 1916 had asked the Society to make with reference to women's wages.

The meeting would be interested to know, the Chairman proceeded, that all Government Departments concerned had been notified of the incorporation of the Society, and it was recognised that the Society was the representative body to look to on any question affecting the aircraft industry.

The Chairman then submitted to the meeting the name of Messrs. George A. Touche and Co., chartered accountants, who were advising the Society in connection with the excess profits question, as the Society's auditors for the coming year, and on the proposal of Mr. R. O. Cary (The Sopwith Aviation Co., Ltd), seconded by Mr. Hamilton Fulton (Martinsyde, Ltd.), Messrs. G. A. Touche and Co. were appointed auditors to the Society accordingly.

The Chairman pointed out that the present Council of the Society consisted of the representatives of those firms who joined the Society in the beginning. He was going to propose to the Council at their meeting that the representatives of the ordinary members who had joined since should be added to the Council, which would then be fully representative of the ordinary members of the Society. It would, however, be necessary to consider the question of the representation of associate members on the Council, and he suggested that this matter should be left over for further consideration.

This completed the business of the Ordinary General Meeting, and a meeting of the Council was held immediately afterwards, at which the following gentlemen were added to the Council:—

Mr. W. H. Allen (representing Messrs. W. H. Allen, Son and Co., Ltd.).

Capt. I. F. Fairbairn Crawford (representing Sir W. G. Armstrong Whitworth and Co., Ltd.).

Mr. C. T. Pullinger (representing Arrol-Johnston, Ltd.).

Mr. A. H. R. Fedden (representing Messrs. Brazil, Straker and Co., Ltd.).

Mr. N. G. Gwynne (representing Messrs. Gwynnes, Ltd.).

Mr. C. Smith representing The Eastbourne Aviation Co., Ltd.).

Mr. G. F. Joseph (representing Portholme Aerodrome, Ltd.).

The Council dealt with various matters which were on the agenda.

Wires and Cables for Aircraft.

WHEN requiring any article on which a great deal depends it pays in the long run to go to specialists—those who know the requirements which have to be met, and the capabilities of the goods which they supply. In connection with the wire, &c., for the stays of aeroplanes, Messrs. George Cradock and Co., Ltd., have made, as our readers know, a special study of the strains and stresses imposed, and their first pamphlet on the subject has been found very useful by designers and manufacturers. They have now produced a new edition, which includes details of a number of strands and cables which have come into use since the original list was compiled. Tables are given showing the dimensions, weight, breaking strain, &c., of the various cables, and the construction of the cable is illustrated. Copies of the list may be obtained by those interested, who apply to Messrs. George Cradock and Co., Wakefield.

For Bronze and White Metal Castings.

MESSRS. Y. E. S., LTD., are now fully installed in their new foundries at Upper Wortley Road, Wortley, Leeds, and are very fully occupied at present in supplying the leading engine builders with Y. E. S. aero bronze, cast by the "Eatonia" process, for bushes of aero engines of various types—a trade which has developed and is developing very rapidly with them.

The firm also supply castings to any size and weight in either gunmetal, brass or phosphor-bronze to any specification and inspection, and their new foundries are very spacious, and have been laid down especially for the economical handling and rapid production of this class of work, so that notwithstanding being so busy on Government work they are able to give just such delivery as may be required on a considerable output.

A.S. Co.'s Developments.

THE phenomenal success of the Aircraft Supplies Co., Ltd., under the management of Mr. Mansfield, has necessitated the opening of a West-End branch. For this purpose offices have been taken at 166, Piccadilly, W., and we understand that Mr. Bernard Isaac will be associated with the firm in this new departure.

A G.E.C. Move in Ireland.

THE G.E.C., Ltd., of London and Witton, Birmingham, &c., advise us that the address of their Cork branch—from whence all orders from the south of Ireland are attended to—has now been altered to 76, Grand Parade.

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NEW COMPANIES REGISTERED.

Elliott Brothers (London), Ltd.—Capital £90,000, in £1 shares. Acquiring business carried on by W. O. Smith, W. S. Smith, G. K. B. Elphinstone, and L. W. Smith at Century Works, Lewisham, and 1, Central Buildings, Westminster, as Elliott Brothers, mechanical and electrical engineers, &c. First directors, W. O. Smith, G. K. B. Elphinstone, and L. W. Smith.

Fox Aeronautical Synd., Ltd., 14, Bedford Street, Covent Garden, W.C.—Capital £2,500, in £1 shares. Acquiring from T. Waterhouse, L. C. Woolldridge, and A. Fox the benefit of an invention relating to an impregnating composition or process for proofing fabrics, wire mesh, wood, leather, and other materials against the action of air, gas, water, and fluids; to manufacture and deal in aerial conveyances and component parts thereof, &c. First directors, T. Waterhouse, A. Fox, L. C. Woolldridge, and E. P. Moorhouse.

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Aeronautical Patents Published.

Applied for in 1915.

Published July 6th, 1916.

8,649. E. R. CALTHROP. Safety spring slings or suspension-devices for use with parachutes.

9,370. S. L. WALKDEN. Aeroplanes, &c.

Applied for in 1916.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.

1,857. R. CAUDRON. Fixing or anchoring means for ropes, cables, &c. (100,650.)

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Founder and Editor: STANLEY SPOONER.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

Our Air Supremacy.

SOME of the "evidence" at the long-drawn-out R.F.C. Inquiry which drags on week after week reads very like unto ancient history—as history is being made these days—and the repeated challenges as to British supremacy in the air are a striking travesty upon the position of our Air Services as they are to-day. Whatever he shortcomings in Government foresight in the earlier ays of hostilities and failure here and there in departmental organisation to make good, there can be "no possible probable doubt, no possible doubt whatever" that the R.F.C. and our French Allies now have and or some little time have had the whole air situation o thoroughly in hand as to handicap most seriously the tactics of the German Staff in the disposition of their main and reserve units. Temporarily, for quite a short period, it is idle to suggest that the German flying men did not by a bit of luck and clever tactics succeed a few months ago in bothering our air forces in France a good deal. But that is where the ancient history of the Air Committee evidence comes in, and it is good reading in the accounts now coming along from all sides to find the absolute confidence and daring which permeates the entire *personnel* of the R.F.C. in its work over and away back beyond the German lines. Not only does this outstanding fact loom large in official *communiqués* and the various correspondents' descriptions of the work in progress in France, but from private sources the position of affairs is confirmed in no uncertain manner. Only this morning, as we are writing, a letter reaches us from an officer—a personal friend—in the trenches "somewhere" out there which is worth quoting as a live document, and this is how he passes on his impressions:—

"The last four or five days we have had excellent scraps in the air above us, and have shot down three Hun planes, the third this morning at sun-up.

"At this part of the line our airmen reign supreme, and our 'Archies' are handled very well. This morning after the Hun had come down (in the Hun lines unfortunately), one of our fellows sailed leisurely over to the enemy and cruised calmly up and down for a long time over their trenches and quite low.

"I simply rolled with laughter. The Huns had about two 'Archies' firing for all they were worth, all their machine guns—able to—concentrated their fire, and the infantry in the trenches got going with rapid on to him. It was too funny for words; he ignored absolutely what must have been a perfect hail of lead, and in the most exasperating manner possible literally 'walked' up and down with engine half speed. For a piece of consummate impudence it wanted a lot of beating. Well, not satisfied quite, when he returned he stopped over No Man's Land and looped the loop ten times right off, and then went home to 'brekker.' He must be the same chap who loops the loop in the evening, and 'some boy,' too."

It would be impossible to refer here to a tithe of the references bearing upon the same conclusion, which have appeared from the leading war correspondents, and which have in the main been brought together for future reference in another section of "FLIGHT," but one and all are insistent, almost day by day, as to our having practically "blinded" our arch enemies by our Air Services' superior tactics and fearless method of operating in the air. Merely to quote a couple of passages from the despatches of the *Times* special correspondents, full of pregnant suggestions, is sufficient to "point the moral," the one appearing on Wednesday of last week and the other on Monday last. In a long and very vivid account on the 5th of the third day of the great battle he writes :—

"Another necessary comment on the situation is the continued and amazing demonstration of our supremacy in the air. It is an extraordinary sight to see our aeroplanes, singly and in squadrons, sailing almost as they please over the lines and far out of sight over the enemy's territory with never a German machine appearing. If ever one does have the temerity to come near the front it is immediately hunted home, and goes, as Kipling says, 'like a cat along a fence.' Closely related to this is the fact that to-day I again counted no less than 16 of our kite balloons floating serenely over our lines, while only two German balloons were in sight, far in the rear of the enemy positions."

In the second article, on the 10th, dealing with the joint operations, the *Times* correspondent particularly joins up the French Air Service in his praises thus :—

"In the first stage of the offensive, in the air fighting the French were completely masters. On June 28th French squadrons destroyed all the German sausage balloons over the front, and for two days before the infantry fighting not a single sausage dared to show itself. In the same period only nine enemy aeroplanes were seen, not one of which attempted to cross the Fre lines. The last troop movements and the last artil disposition were thus effected in secrecy."

From the German versions of what is happening air reconnaissance, it might be imagined that the A are hopelessly outclassed. But this need not dis anybody. Our own known facts and figures so dire give the lie to the false statistics spread abroad, obvious reasons, from German sources that the H concoctions, by the very intensity of their mendaci ness, carry their own antidote. Under the circumstan most folk will appreciate the rather apposite interp tions at the Inquiry Committee of Mr. Jus Bailhache in regard to present conditions of af automatically supplying the answers to many of unnecessary questions which have helped to prol the labours of the Air Committee unto weariness. we suggested several weeks ago, the more quickly Committee can complete its purpose and release s men as Sir David Henderson for highly valuable urgent war work, the better everybody, having country's and the aircraft industry's welfare at heart, be pleased. We have had no reason since to mo that view from anything that has transpired at the pu meetings of the Committee, and we are glad to no that Lord Montagu of Beaulieu expressed the same v as recently as last week. The whole business is a s spectacle from an Imperial point of view, although i for many reasons, just as well, perhaps, that the inq has been held. That its labours may not endure m longer is once again the fervent hope of ourselves. prolongation is not helpful to those chiefly concern and the measure of indifference of the general reader its "'orrible disclosures" is well reflected in the gra ally diminishing space accorded its proceedings in columns of the one-time ha'penny champions of its ca It is not unlikely to prove to be the obsequies of m so-called scandals and misconceptions, and possibly the hopes and ambitions of not a few.

* * * *

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties :—

Died of Injuries.

1st Grade Air-Mechanic A. Hampson, R.N.A.S.

The following casualties have been officially announced by the War Office :—

Killed.

Second Lieutenant J. C. Simpson, Royal Flying Corps.

Previously reported Missing, now reported Killed.

2056 1st Class Air-Mechanic H. Kirkbride, Royal Flying Corps.

Died.

21833 2nd Class Air-Mechanic E. Whitfield, Royal Flying Corps.

Wounded.

Second Lieutenant C. L. Cordon, Wilts Regt., attached R.F.C.
Captain S. G. Gilmour, Royal Flying Corps.
Captain J. K. Law, R. Fusiliers and R.F.C.
Lieutenant E. A. Packe, Oxford and Bucks L.I., attached R.F.C.
Lieutenant G. W. Panter, R. Irish Rifles, attached R.F.C.
Second Lieutenant A. A. N. Pentland, Royal Flying Corps.
Major L. W. B. Rees, R.G.A. and R.F.C.
Second Lieutenant E. M. Roberts, Royal Flying Corps.
Lieutenant A. N. Solly, Manchester Regt., attached R.F.C.
23181 2nd Class Air-Mechanic E. H. Carman, Royal Flying Corps.
9337 2nd Class Air-Mechanic E. E. F. King, Royal Flying Corps.
17315 2nd Class Air-Mechanic D. V. Lindsay, Royal Flying Corps.
23485 2nd Class Air-Mechanic G. W. H. Weeden, R Flying Corps.

Previously reported Missing, now reported Wounded and Prisoner of War.

Lieutenant A. Cairnduff, Royal Flying Corps.

Missing.

Lieutenant R. Burgess, A.C.C., attached R.F.C.
Captain T. W. P. L. Chaloner, Yorks. Regt. and R.F.C.
Second Lieutenant C. H. Coxe, Royal Flying Corps.
Second Lieutenant J. H. Firstbrook, Royal Flying Corps.
Second Lieutenant E. B. Harvey, London Regt., atta R.F.C.
Lieutenant I. C. MacDonell, Canadian Cavalry, attac R.F.C.
Second Lieutenant K. P. MacNamara, Royal Flying Corps.
Second Lieutenant C. Monckton, R. Irish Fus. and R.F.C.
Second Lieutenant J. F. P. B. Quinlan, R.F.A., attac R.F.C.
Second Lieutenant R. C. Stoddard, Royal Flying Corps.
Second Lieutenant J. W. Toone, R. Irish R. and R.F.C.
Lieutenant W. O. T. Tudor-Hart, Northd. Fus., attac R.F.C.
Second Lieutenant C. I. Van Nostrand, Royal Flying Corp
Captain G. W. Webb, R. Irish Rif. and R.F.C.
Second Lieutenant H. A. Williamson, Manchester Re attached R.F.C.
Second Lieutenant L. A. Wingfield, R. Fus. and R.F.C.
10387 2nd Class Air-Mechanic T. N. U. Robinson, R Flying Corps.
3613 Sergeant H. Taylor, Royal Flying Corps.
1746 Sergeant G. Topliffe, Royal Flying Corps.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of July 4h:—

G. G. Dawson granted a temporery commission as Lieutenant, seniority April 29th, and appointed to "President," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of July 6th:—

The following have been entered as Probationary Flight Sub-Lieutenants (temporary), seniority July 5th, and all appointed to "President," additional, for R.N.A.S.: C. W. Howitt, H. M. Morris, A. G. B. Ellis, M. W. Buckley, E. R. Barker, L. E. B. Wimbush, J. H. Solomon, E. W. Busby, F. L. Green, J. G. A. A. Case, W. A. Scott, C. J. Huddy, C. V. Halford-Thompson, G. W. Hemming, E. T. Hayne, J. S. Smith, F. C. F. Walwin, F. S. Russell, and H. L. Smith.

The following appeared among the Admiralty announcements of the 10th inst.:—

Warrant Officers F. H. Williams and L. J. Killmayer (both 1st grade) and C. F. Rasmusen (2nd grade), all promoted to temporary rank of Flight-Lieutenant, seniority of July 6th. The following temporary entries (R.N.V.R.) have been made, seniority of July 8th: Lieutenants—P. A. Jackson, D. A. B. Hill, P. M. Hampshire, G. Robbins and J. Matthew; Sub-Lieutenant—J. J. James, all appointed to "President," for R.N.A.S.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of July 4th:—

Flight-Commanders (from Flying Officers, and to be Temporary Captains whilst so employed).—Temporary Lieut. R. Raymond-Barker, General List; June 17th, 1916. Second Lieut. (Temporary Lieut.) G. R. M. Reid, Arg. and Suth'd Highrs. (Special Reserve); June 19th, 1916.

Assistant Equipment Officers.—Second Lieut. E. G. A. Lefrere; June 19th, 1916. Temporary Second Lieut. R. G. Hutchinson, General List; June 20th, 1916. Second Lieuts. A. N. Appleford and G. P. Achurch, Special Reserve; June 21st, 1916.

Memoranda.—To be Temporary Second Lieutenants: Sapper James M. Macaulay, from R.E. (T.F.), for duty with the R.F.C.; June 14th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: K. A. C. Creswell, E. G. A. Lefrere, D. MacK. P. Riach, A. J. M. Ross, J. H. Inskip, F. L. W., Viscount Combermere, W. M. Bevan, G. Gilling, H. F. Wright, F. M. Carter, W. H. Hubbard, R. E. A. Macbeth, F. C. Biette, A. E Glew, W. Roche-Kelly.

To be Second Lieutenants (on probation): Percy M. T. Hill; May 30th, 1916. Kenneth W. P. Hindley; June 5th, 1916. Arthur O. Betts; June 14th, 1916. Arthur L. Butcher, June 16th, 1916. John W. G. Mackinlay; June 19th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 5th:—

Temporary appointment at War Office.

Staff-Lieutenant.—Second Lieut. C. H. Whittington, R.F.C., Special Reserve, from an Assistant Equipment Officer, *vice* Qmr. and Hon. Lieut. (Temporary Capt.) W. J. D. Pryce, R.F.C.; May 27th, 1916.

Establishments.

Depôt-Commanders (from Squadron-Commanders, and to be Temporary Lieut Colonels whilst so employed).—May 31st, 1916: Temporary Major S. E. Smith, Glouc. R. (T.F.); Capt. (Temporary Major) A. Huggins, Special Reserve; Capt. (Temporary Major) R. H Collier, Special Reserve; Capt. (Temporary Major) R. C. Donaldson-Hudson, Shrops. Yeo. (T.F.) Reserve.

Park Commanders (from Squadron-Commanders and to retain their Temporary rank whilst so employed).—May 10th, 1916: Capt. (Temporary Major) D. G. Conner, R.F.A.; Capt. (Temporary Major) G. B. Hynes, R.G.A.; Capt. (Temporary Major) G. C. R. Mumby, Special Reserve: Qmr. and Hon. Lieut. (Temporary Major) A. Fletcher, R.F.C.; Qmr. and Hon. Lieut. (Temporary Major) F. H. Kirby, V.C., R.F.C. Temporary Major A. E. G. MacCullum, General List; June 7th, 1916. From Equipment Officers and to be Temporary Majors whilst so employed: Capt. A. ap Ellis, W. Rid. Divl. Sig. Co., R.E. (T.F.); June 1st, 1916.

The Warneford Memorial.—The unveiling ceremony, by Lord Derby, at West Brompton Cemetery on Tuesday afternoon. The scene immediately after the unveiling. Those present included Lt.-Col. Corkery, Mrs. Corkery (the V.C.'s mother), and sisters, Commodore Murray Sueter, R.N., &c. Detail photographs of the model of the Memorial appeared in "FLIGHT" of December 10th, 1915.

Lieut. (Temporary Capt.) C. Defries, Special Reserve; June 16th, 1916.

Flight-Commander.—Temporary Second Lieut. R. L. Farley, General List, from a Balloon Officer, and to be Temporary Captain whilst so employed; June 2nd, 1916.

Equipment Officers.—Qr.-Mr. and Hon. Lieut. W. J. D. Pryce, R.F.C., from a Staff-Lieutenant, and to be Temporary Captain whilst so employed; May 27th, 1916. *From Assistant Equipment Officers, and to be Temporary Captains whilst so employed.*—Lieut. C. Hirtzell, Special Reserve; May 27th, 1916. Second Lieut. F. C. V. Laws, Linc. R.; June 1st, 1916. Lieut. A. M. Cott, Special Reserve; June 19th, 1916. Second Lieut. B. May, Special Reserve; June 20th, 1916.

Flying Officers.—Second Lieut. K. L. Gopsill, E. Surr. R. (Special Reserve); May 29th, 1916. June 4th, 1916: Capt. G. W. Williamson, Manch. R. (Special Reserve), and to be seconded; Lieut. R. H. Shears, Shrops. L.I., and to be seconded; Temporary Second Lieut. L. C. Burcher, Worc. R., and to be transferred to the General List. June 10th, 1916: Temporary Second Lieut. S. K. Muir, K.R. Rif. C., and to be transferred to the General List; Second Lieut. W. H. Hubbard, Special Reserve; Second Lieut. R. E. A. Macbeth, Special Reserve; Second Lieut. E. D. Steytler, S. Lan. R., and to be seconded. June 14th, 1916: Second Lieut. (Temporary Lieut.) S. P. Smith, A.S.C. (T.F.); Second Lieut. F. C. Biette, Special Reserve. June 15th, 1916: Second Lieut. J. G. Cameron, Camn. Highrs., and to be seconded; Second Lieut. W. Roche-Kelly, Special Reserve. Temporary Second Lieut. W. M. Fry, Som. L.I., and to be transferred to the General List; June 16th, 1916. June 17th, 1916: Capt. C. H. B. Blount, R. W. Surr. R., and to be seconded; Second Lieut. (Temporary Lieut.) R. C. B. Riley, War. Yeo. (T.F.); Second Lieut. R. H. M. S. Saundby, R. War. R. (T.F.); Temporary Second Lieut. S. Alder, Notts. and Derby R., and to be transferred to the General List; Temporary Second Lieut. W. J. Tempest, Garr. Bn., Yorks. L.I., and to be transferred to the General List; Second Lieut. (on probation) W. T. Coles, Oxf. and Bucks. L.I., Special Reserve, and to be seconded; Second Lieut. F. M. Carter, Special Reserve; Second Lieut. A. E. Glew, Special Reserve. Second Lieut. J. T. Morgan, R. W. Fus., and to be seconded; June 18th, 1916. June 19th, 1916: Second Lieut. (on probation) R. Gregory, 4th Conn. Rang., Special Reserve, and to be seconded; Second Lieut. D. H. S. Davies, R. War. R., and to be seconded.

Flying Officers (*Observers*).—June 19th, 1916: Lieut. E. W. Bowyer-Bower, E. Surr. R., Special Reserve, and to be seconded; Second Lieut. G. A. Exley, Yorks. L.I. (T.F.). June 20th, 1916: Second Lieut. (Temporary Lieut.) H. E. Wood, Border R. (T.F.); Temporary Second Lieut. D. M. Deighton, A.S.C., and to be transferred to the General List; June 21st, 1916. Temporary Lieut. F. D. Stevens, Motor Mach. Gun Serv., and to be transferred to the General List; Temporary Lieut. G. G. Moore, R. Highrs., and to be transferred to the General List; Second Lieut. R. R. Gaskell, R.E. (T.F.); Temporary Second Lieut. H. E. Scoones, General List; Second Lieut. C. V. J. Borton, Norf. R., and to be seconded; Temporary Second Lieut. F. Beaumont, General List; Second Lieut. T. S. Roadley, S. Staff. R. (Special Reserve), and to be seconded; Second Lieut. (on probation) H. R. Jaques, S. Staff. R. (Special Reserve), and to be seconded; Second Lieut. C. Turner, Worc. R., and to be seconded; Second Lieut. E. A. Packe, Oxf. and Bucks L.I., and to be seconded; Second Lieut. H. A. D. Mackay, Hamps. R., and to be seconded. Lieut. C. S. Peach, W. Yorks. R., and to be seconded; June 24th, 1916.

Memorandum.—The undermentioned to be Temporary Second Lieut.: Corpl. Michael Oswe Illingworth, from R.F.C., for duty with the Mil. Wing of that Corps; June 12th, 1916.

Special Reserve of Officers.—The undermentioned Second Lieuts. (on probation) are confirmed in their rank: W. W. Lang, W. E. Soper, A. B. Fanstone, M. W. Wilson, H. J. de C. Moore, F. J. Game, T. G. Mellanby.

The following appeared in a supplement to the *London Gazette* issued on July 6th:—

Temporary appointment made at the War Office.

Staff Lieutenant.—Second Lieut. H. J. de C. Moore, R.F.C., Special Reserve; June 22nd, 1916.

Establishments.

Balloon Officers.—May 26th, 1916: Temporary Capt. J. O. Davis, General List, with seniority from April 17th, 1915. Temporary Capt. Hon. A. S. Byng, General List, with seniority from April 19th, 1915. Temporary Lieut. A. C. B. Geddes, General List, with seniority from June 30th, 1915. Temporary Lieut. E. B. Cowell, General List, with seniority from July 23rd, 1915.

Assistant Equipment Officer.—Second Lieut. D. MacK. P. Riach, Special Reserve; June 19th, 1916.

Memoranda.—Flight-Lieutenants, from R.N.AS., to be Temporary Captains for duty with the R.F.C.; May 26th, 1916: John O. Davis, with seniority from April 17th, 1915; Hon. Ant S. Byng, with seniority from April 19th, 1915.

Flight Sub-Lieutenants, from R.N.A.S., to be Tempo Lieutenants for duty with the R.F.C.; May 26th, 1916: Alas C. B. Geddes, with seniority from June 30th, 1915; Ebenezer Cowell, with seniority from July 23rd, 1915.

The following appeared in the *London Gazette* of July 7th:—

Flying Officers.—Temporary Second Lieut. W. B. Power, Gen List; May 30th, 1916. Temporary Second Lieut. E. L. Pears General List; May 31st, 1916. June 17th, 1916: Lieut. I. Barcloy, Sea. Highrs., and to be seconded; Temporary Sec Lieut. F. Sowrey, R. Fus., and to be transferred to the Gen List; Temporary Second Lieut. A. F. A. Patterson, W. York and to be transferred to the General List. June 19th, 1916: Sec Lieut. (Temporary Capt.) A. T. Loyd, E. Kent R. (T.F.).; T porary Lieut. G. G. B. Downing, Welsh R., and to be transfer to the General List; Temporary Second Lieut. (Temporary Lie G. W. M. Green, Army Cyclists Corps, from a Flying Offi (Observer) and to be transferred to the General List; Sec Lieut. W. W. Lang, Special Reserve; Temporary Sec Lieut. A. W. Reynell, E. Surr. R., and to be transferred to General List; Second Lieut. W. E. Soper, Special Reserve; Sec Lieut. A. B. Fanstone, Special Reserve; Second Lieut. N. Wadham, Rif. Brig., and to be seconded. June 20th, 19 Temporary Second Lieut. R. M. Hill, North'd Fus., and be transferred to the General List; Second Lieut. A. H. Bott R. War. R., from a Flying Officer (Observer); Second Lie C. E. H. C. Macpherson, R. Dub. Fus., and to be second Second Lieut. M. W. Wilson, Special Reserve. June 21st, 19 Bt. Major A. J. Ross, R.E., from a Flying Officer (Observe Second Lieut. C. A. Hore, N. Staff. R., and to be seconded.

Flying Officers (*Observers*).—June 1st, 1916: Second Lieut. R Clegg, Lan. Fus. (Special Reserve), and to be seconded; Tempor Second Lieut. J. Brown, R.F.A.; Temporary Second Lieut. K. Cruickshank, Lan. Fus., and to be tranferred to the General Li Temporary Second Lieut. D. Langlands, R. Suss. R., and be transferred to the General List; June 8th, 1916. June 12 1916: Lieut. E. H. Bird, R. Fus. (since killed in action), a to be seconded; Second Lieut. (Temporary Lieut.) J. A. Mar Sco. Rif. (T.F.); Second Lieut. J. C. M. Stewart, W. Yorks. (T.F.); Temporary Second Lieut. R. V. Walker, Conn. Rang., a to be transferred to the General List; Temporary Second Lie J. A. Hinchcliffe, York. L.I., and to be transferred to the Gene List; Second Lieutenant J. C. Barraclough, York. R., and to seconded; Second Lieut. W. E. Young, Dorset R. (Spec Reserve), and to be seconded; June 13th, 1916.

Assistant Equipment Officers.—Second Lieutenant H. J. de Moore, Special Reserve; June 1st, 1916. Second Lieut. F. Game, Special Reserve; June 23rd, 1916. Second Lieut. T. Mellanby, Special Reserve; June 24th, 1916.

Attached to Headquarter Units.

Brigade-Major.—Temporary Capt. F. A. Forde, from a Win Adjutant, R.F.C., vice Major R. James, N. Staff, R.

The following appeared in a supplement to the *London Gaz* issued on July 8th:—

Memorandum.—Allen P. Adams, from Second Lieutenant (probation), R.F.C. (Special Reserve), to be Temporary Seco Lieutenant on the General List; July 9th, 1916.

The following appeared in a supplement to the *London Gaz* issued on the 10th inst.:—

Wing-Commanders (*from Squadron-Commanders, and to Temporary Lieutenant-Colonels whilst so employed*).—Major B. W. Beor, R.A.; June 18th, 1916. Major T. C. R. Higgi R. Lanc. R.; June 25th, 1916.

Flying Officers (*Observers*).—June 25th, 1916: Tempora Second Lieut. C. K. M. Douglas, R. Scots, and to be transfer to the General List; Second Lieut. C. E. M. Pickthorne, A.S. (Special Reserve); Second Lieut. W. McKay, Sea. Highrs., and be seconded.

Memoranda.—2nd Class Air-Mechanics, from R.F.C., to Temporary Second Lieutenants for duty with the Military Wing that Corps: Maurice W. Dickens; June 12th, 1916. Gilb Howe; June 19th, 1916.

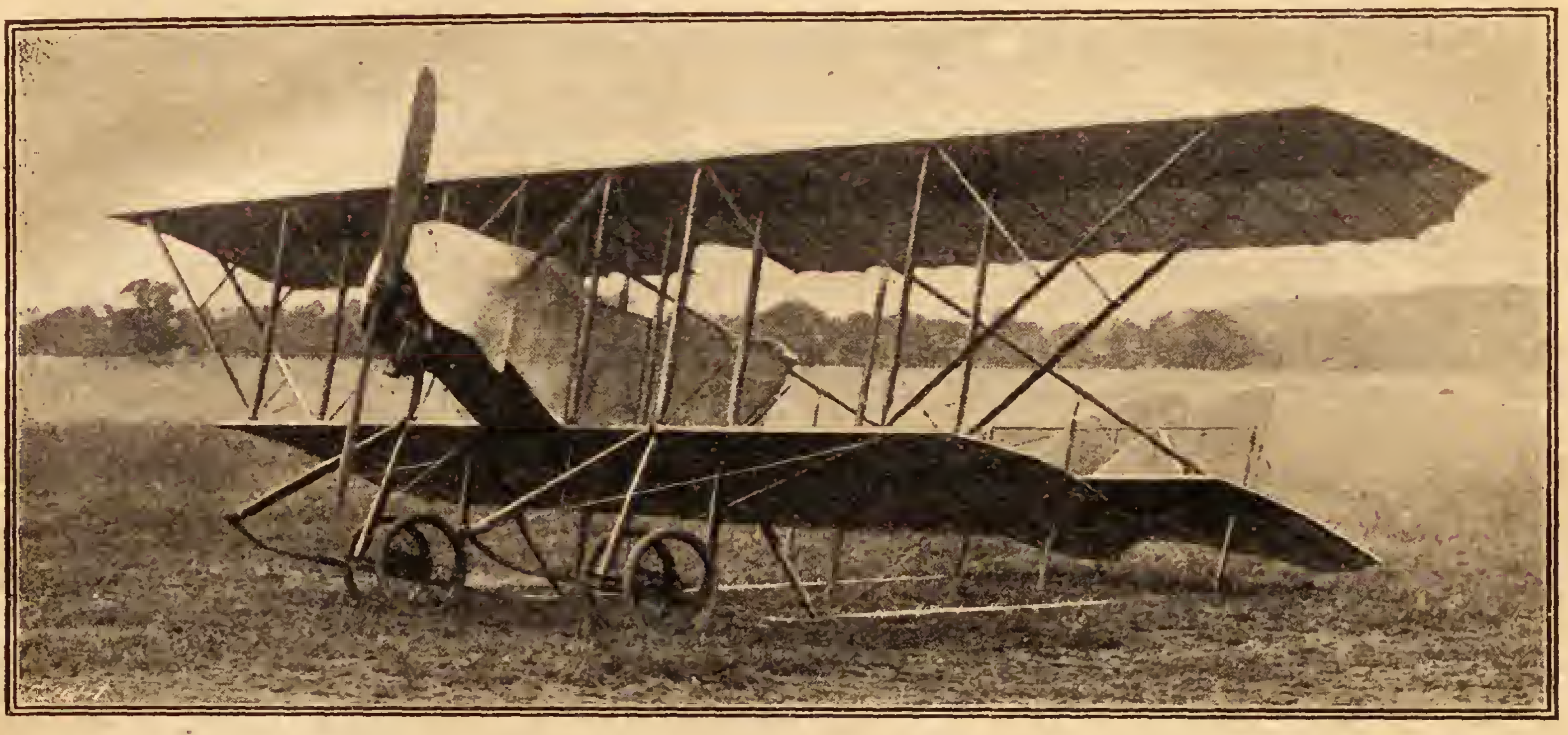
Royal Flying Corps (Territorial Force).

The following appeared in a supplement to the *London Ga* issued on July 6th:—

Hampshire Aircraft Parks.—Captains to be Temporary Majors Adjutant A. R. Martin, and to remain Adjutant; May 1st, 191 C. H. Douglas; June 1st, 1916. G. B. Turner; June 1st, 191 C. K. Butler Stoney; June 1st, 1916. Lieutenants to be Temporary Captains; June 1st, 1916: R. Whiddington, R. M. Maxwell, and S. W. Hiscocks. Second Lieut. W. S. Farren confirmed in his rank. Second Lieut. W. S. Farren to be Temporary Captain; June 1st, 1916. Second Lieuts. to be Tempora Lieuts.; June 1st, 1916: F. A. Short, A. R. Langton, A. Elliott, S. J. Waters and J. H. Glover.

CONSTRUCTIONAL PROGRESS AT THE RUFFY-BAUMANN SCHOOL OF FLYING.

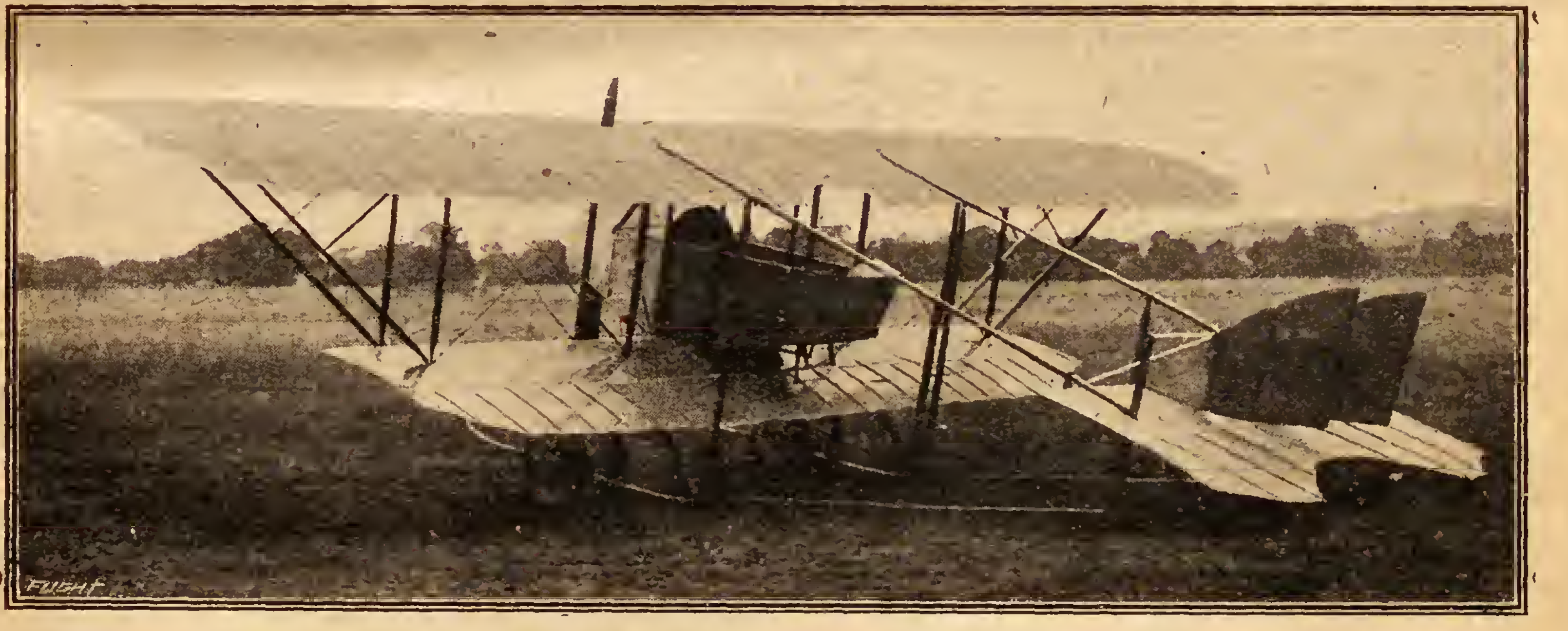
Apart from the hard usage of a machine engaged on actual war service, it is doubtful whether there exists any form of work which tests a machine more severely than that to which it is subjected at a flying school. For this reason it is a matter of some interest to follow the evolution of the various details of a school machine even if its general design follows closely along standard lines. A case in point is the school type of machine built and flown at the Ruffy-Baumann school of flying at Hendon. Although these machines are admittedly of the Caudron type—a type, by the way, which has proved itself through a number of years exceptionally suitable for instruction purposes—following closely along the lines of the original machine, a close inspection soon reveals a number of detail alterations, suggested by years of experience in school work. Some of these alterations are in the nature of strengthening up parts which, although standing up well to stresses imposed in ordinary flying, have been found somewhat liable to give way under the severe treatment frequently meted out to a machine at the hands of a beginner in the gentle art of flying, while others have been made with the object of improvement from the point of view of quickness and cheapness of manufacture rather than from one of constructional strength.



"Flight" Copyright.

Three-quarter front view of the 60 h.p. Ruffy-Baumann school biplane.

In the accompanying photographs and sketches some of the constructional details of the Ruffy-Baumann biplanes are illustrated, giving a better idea than is possible by means of a written description of the various fittings and parts employed. As the new 60 h.p. two-seater is the latest type, this has been chosen for purposes of illustration. On inspecting the machine, one of the first things one notices is the fact that the *nacelle*, instead of being mounted on stepped struts some little distance above the lower wing, rests with its lower *longerons* on the spars of this, being attached to the inner plane struts by bolts in the manner shown in one of the accompany-

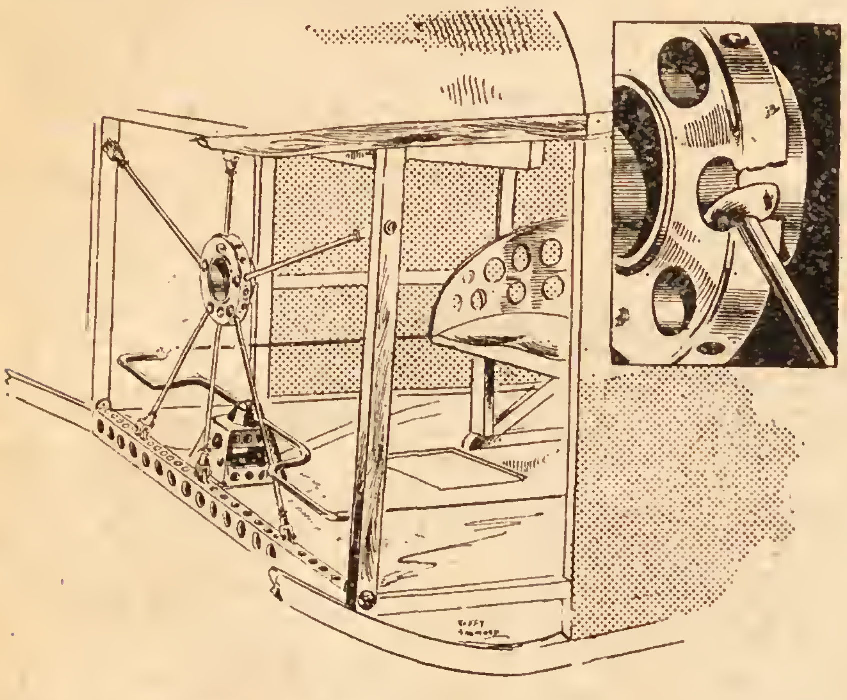


"Flight" Copyright.

Three-quarter rear view of the 60 h.p. Ruffy-Baumann school biplane.

ing sketches. This gives a somewhat deeper body of rather better shape than the old one, and the cowl round the Gnome engine forms a fairly good entry for the air.

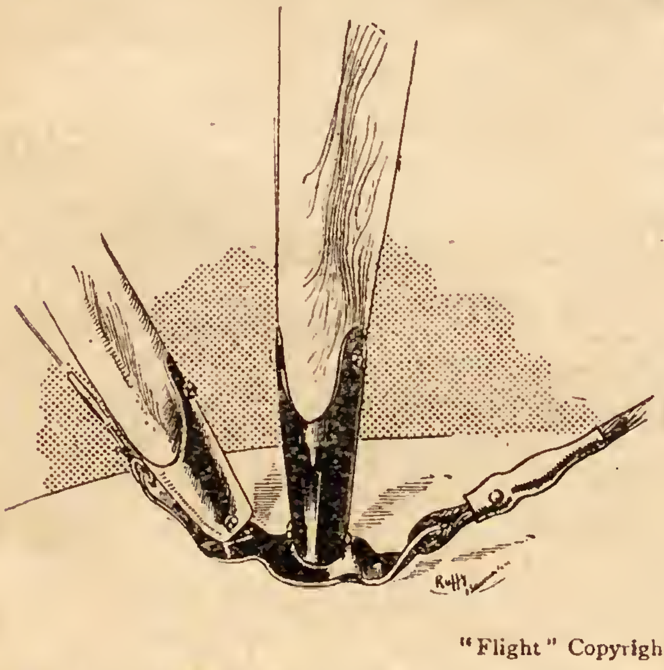
As dual control is fitted on all the machines built by



"Flight" Copyright.

The rear engine support of the Ruffy-Baumann biplanes. Inset is shown the ball joint of the bracing rods to the collar on the engine shaft.

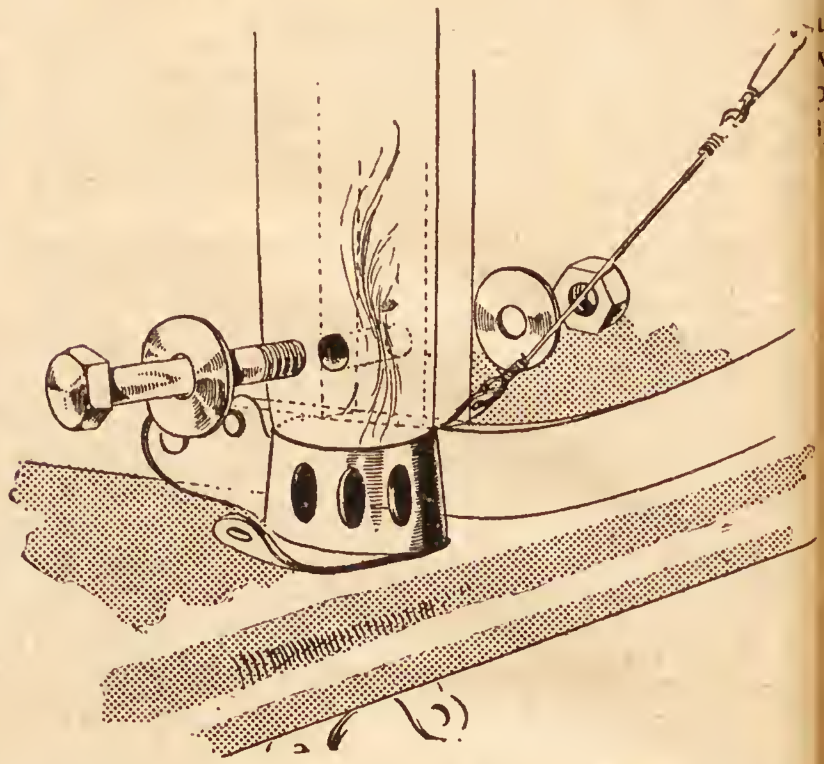
the Ruffy-Baumann school, the rear engine bracing has been somewhat modified in order to provide room for the front foot bar, which, as one of our sketches shows, is in the form of a steel bar, bent to form a step into which fits the pilot's foot. Since the two bracing rods running from the rear engine bearer would have formed an obstruction to the free movement of the foot bar, they are no longer taken to the lower corners of the *nacelle*, but to a point some little distance inside the corners as shown, and since this throws a bending strain on the horizontal strut, that member has been reinforced with a length of channel steel, drilled for lightness. A further alteration differing from standard practice in regard to the rear engine support will be noticed in the illustration.



"Flight" Copyright.

Interplane strut sockets on the Ruffy-Baumann biplanes.

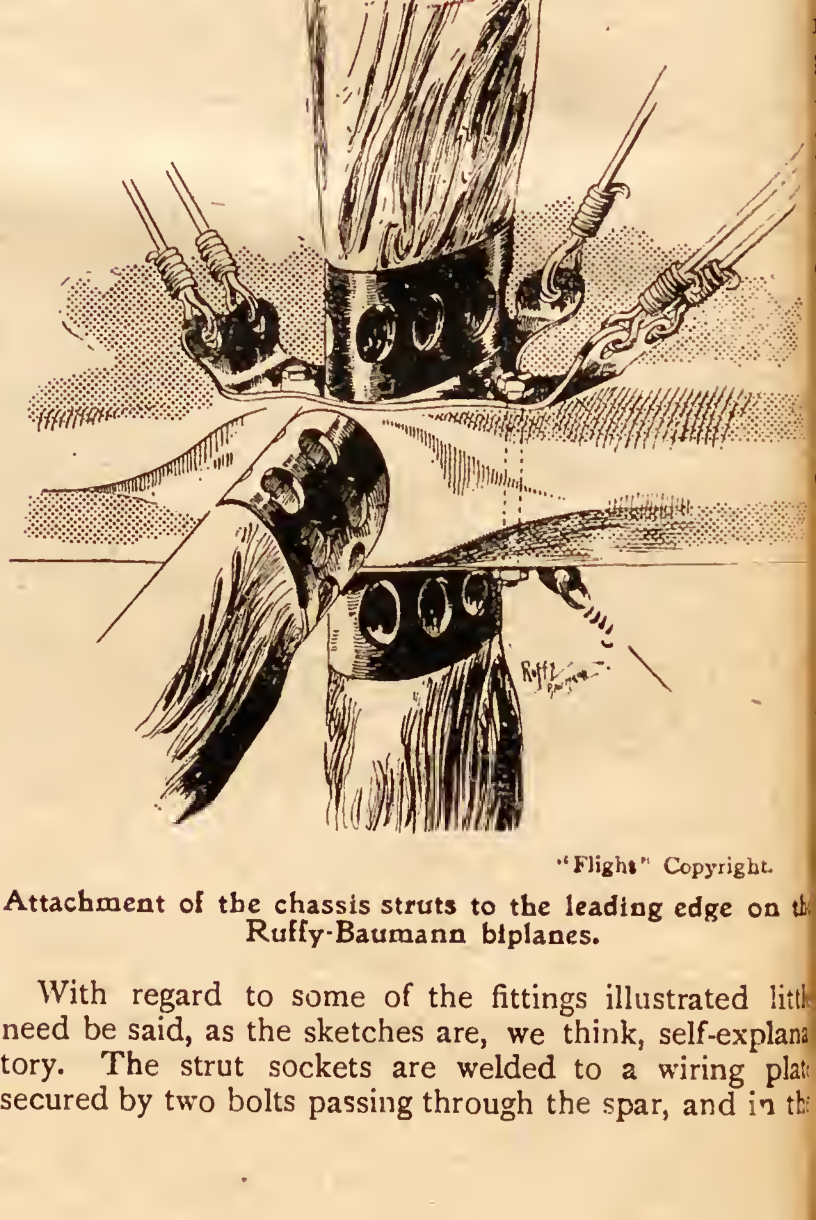
Instead of the usual flanged collar on the induction pipe, to which the bracing rods are attached by means of forked ends, there is a wide collar turned out of a solid steel bar. In this collar are drilled a number of holes a short distance inside the outer edge of the collar, in which are accommodated hemispherical nuts, internally threaded to receive the inner ends of the bracing rods.



"Flight" Copyright.

Sketch showing how the lower *longerons* are secured to the inner interplane struts on the Ruffy-Baumann biplanes.

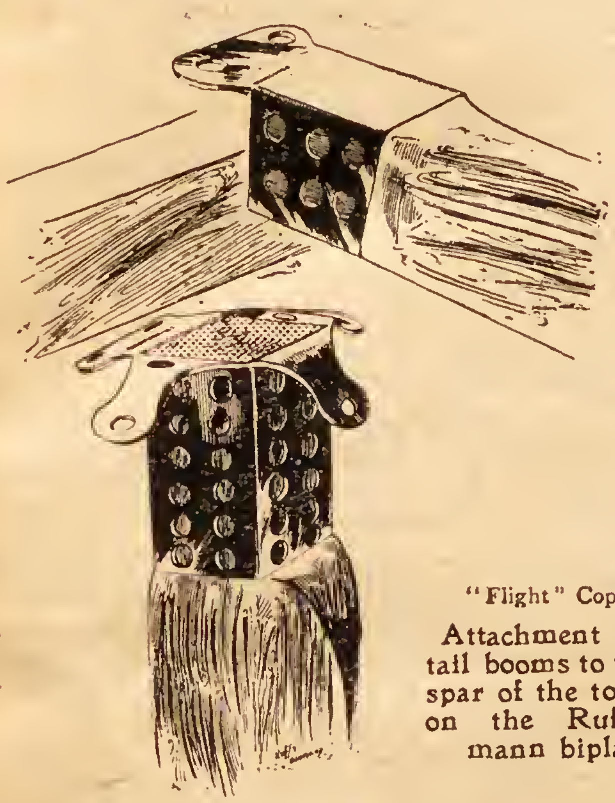
The arrangement will be clear from the inset in the larger sketch. It will be seen that in this manner a universal joint is formed, so that a slight discrepancy in the alignment of the attachment of the outer ends of the bracing rods and the flanged collar on the engine shaft will not be of any consequence.



"Flight" Copyright.

Attachment of the chassis struts to the leading edge on the Ruffy-Baumann biplanes.

With regard to some of the fittings illustrated little need be said, as the sketches are, we think, self-explanatory. The strut sockets are welded to a wiring plate secured by two bolts passing through the spar, and in the ase of the point of attachment of the front skid struts hese, it will be seen, no longer have square ends butting on the flat of the front spar, but fit into sockets velded to a common base plate, thus practically being roof against any tendency to slip sideways along the par. The diagonal bracing struts running from the lower ends of the interplane struts to the extensions of the top plane are no longer made of a steel tube with forked ends, enclosed in a fairing of wood, but are made up of solid spruce, and fitted at the ends with a socket passing over and pivoted to an eyebolt.

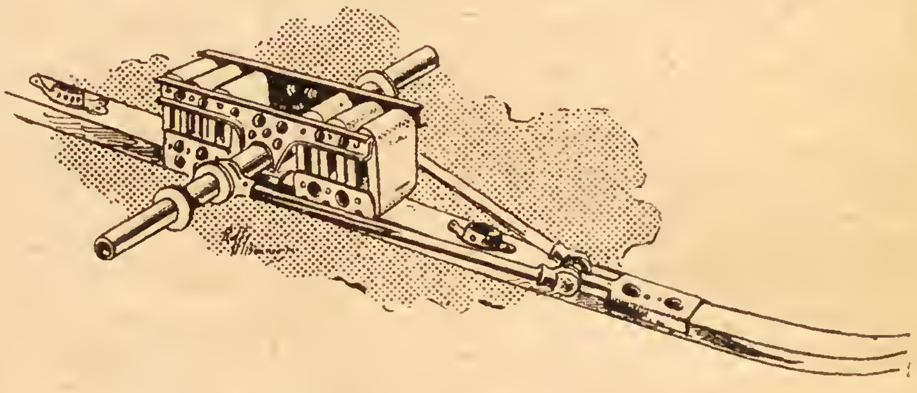


"Flight" Copyright.

Attachment of the tail booms to the rear spar of the top plane on the Ruffy-Baumann biplanes.

One of the features noticed when looking over this machine is the arrangement of the shock absorbers, which gives the impression of being very simple and substantial. Instead of the usual round rubber cord, rectangular section rubber rings are used, each ring passing over two transverse bolts, of which one is held in the lower plate passing around the skid, while the other is secured to the two T-shaped flanged steel plates attached to and, of course, moving with, the wheel axle. In case of a heavy landing one or more of the rubber rings may be broken, but the replacement of a ring or two is an operation occuying a few minutes only, and costing very little. On the other hand, when a rubber cord breaks it usually means either a new cord or an unsightly knot in the old one.

Perhaps one of the most interesting, and certainly one of the least apparent, features of the Ruffy-Baumann biplanes is the method of selecting each rib for the particular work it has to do. In other words, progressing from the wing-tips towards the centre, consecutive ribs are less elastic than the one preceding, so that at the tip, where less load is carried, the ribs are weaker, gradually increasing in rigidity towards the centre. The consequence is that when the machine is flying, the trailing edge of the whole wing forms a straight line instead of bending down in the neighbourhood of the tail booms and up as the tip is approached. There can be little doubt that this form of construction has a very important bearing on the performance of the machine.



"Flight" Copyright.

Sketch showing the shock absorbing arrangement on the Ruffy-Baumann biplanes. The wheels and chassis struts have been omitted for the sake of clearness.

At present there are five biplanes, all fitted with dual control and having Gnome engines of 50 and 60 h.p., in commission at the firm's school at Hendon, where extra accommodation in the form of a large tent has been provided. It might be mentioned that it is only lack of housing space that limits the number of machines, and already a similar number are waiting to be erected at the firm's works at The Burroughs, Hendon. On a recent visit to the works we found workmen busy making foundations for machinery and digging pits for the shafting, and we understand that as soon as delivery can be obtained a number of wood-working machines of various types will be installed, when the output of machines should be greatly accelerated. As a matter of fact, considering the facilities, or rather lack of them, at this firm's disposal in the past, they have turned out the machines at a very good pace, and when the new machinery has been put in, which should be in a week or two, the output will be more than equal to the requirements of the school, leaving a margin for any outside orders that may come along.

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THE "X" AIRCRAFT RAIDS.

The following announcements have been issued by the Field-Marshal Commanding in Chief Home Forces:—

"X 37" Raid. July 9th. *"July 9th.*

"At 10.45 this morning a hostile aeroplane crossed the Kent Coast near the North Foreland, and flew a short distance westward. One of our anti-aircraft guns fired a few rounds at long range, whereupon the enemy turned east, and, flying at a great height, proceeded out to sea. Some of our aeroplanes went in pursuit, but were unable to overtake the enemy. No bombs were dropped."

"X 38" Raid, July 9th–10th. *"July 10th.*

"Shortly before midnight, July 9th–10th, enemy aeroplanes visited the south-east coast of England. From information at present available, about five bombs were dropped. No damage has been reported up to the present. Anti-aircraft guns engaged the raiding machines. No further details are yet to hand."

"July 10th.

"There is nothing fresh to add to the two *communiqués* issued last night concerning yesterday's hostile air raids.

"The first raid over the Isle of Thanet at 10.45 a.m. was carried out by one seaplane. No bombs were dropped, and the raider made off, pursued by our naval aircraft. He was also fired at by anti-aircraft guns, but without effect.

"The second raid over the south east coast at 11.15 p.m. was carried out by one hostile aircraft. The raider dropped seven explosive bombs, but did no damage beyond breaking several windows. He made good his escape.

"There were no casualties of any kind in either raid."

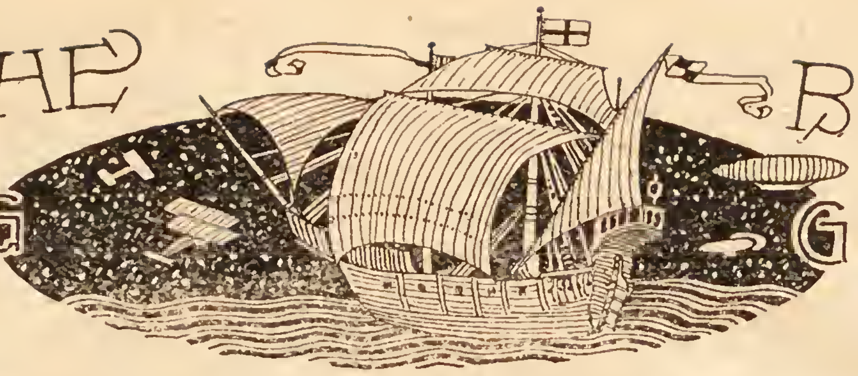
German Version.

"Berlin, July 11th.

"On the night of July 9th–10th two German naval aeroplanes dropped bombs on the port establishments and coast works of Harwich and Dover."

[*It is officially stated that no bombs were dropped on the port establishments or coast works, and the raid on Harwich is an entire fabrication.*]

FROM THE BRITISH FLYING GROUNDS



London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Straights last week with instructor: Messrs. Callard, Cockell, Drew, Edwards, Hodgkinson, Jamie, Keymer, Mulville, Mills, Rodocanochi, Ward and Lyles. Circuits with instructor: Messrs. Donald and Kay. Eights with instructor: Messrs. Cooper, Forster, Goodhart, Phillips, Turner and Wellinkar.

Instructors: Messrs. Biard, Hale, Manton, Pashley, Russell and Winter.

Beatty School.—The following pupils were out during last week: Messrs. Gliksten, Atkin, Kay, Venables, Whitmore, New, Edwards, Jones, Davy, Murdoch, Garlick, Mitchell, Elliott, Earl, Towson, Skeet, McPherson, Hoskins, White, Rudd, Gadsden, de Wilde, Curry, Hick, Wood, Sach, Owen, and Austen.

The instructors were Messrs. G. W. Beatty, G. Virgilio, A. E. Mitchell, and H. Fawcett; the machines in use being Beatty-Wright dual control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes.

Mr. Bruno Roberts flew for his certificate on July 4th.

Hall School.—Pupils out last week:—With Flight-Lieut. Bell: Messrs. Air-Mechanic Halliday, F. Smith, and Glegg. With P. G. Allen (late R.F.C.): Messrs. F. W. Smith, Orton, Lambert Barton, Lieut. Packman, Henley, Illingworth, and Lieut. Yuill. With Cecil M. Hill (Head Instructor): Messrs. Skinner, Duncan, Cottrell-Jones, and Lieut. Deane.

Machines in use: Hall and Caudron (Government type) tractors.

Royal Aero Club certificates taken by Air-Mechanic Halliday (R.N.A.S.), F. Smith, and Glegg; all excellent tickets, and passed in very good style with good landings.

London and Provincial Aviation Co.—Pupils r last week: Messrs. Mander, Leman and Bush. D straights: Messrs. Jones, Daly, Sivewright and Ege Circuits and eights: Mr. W. Evernden.

Instructors: Messrs. W. T. Warren, M. G. S L. H. Brake and W. T. Warren, jun.

Three tractor biplanes in use.

Royal Aero Club certificate taken by Mr. W. Evern

Ruffy-Baumann School.—School out every da week.

Pupils with instructors: Williams (12 mins.), F (68), Bebee (55), Westlake (20), De Balme Wilson (48), Thomas (10), Durand (10), Homes Babington Smith (10), Homes (12), and Fanshaw Pupils doing solos and circuits: Fraser, Durand Wilson. Instructors: E. Baumann, A. Baumann André Thomsen.

Fraser took his ticket in good style, and Durand half the tests.

On Saturday E. Baumann out testing new 60 h.p., took several passengers.

Bournemouth School.

PUPILS rolling alone last week: Messrs. F Montgomery, Ross, J. B. Smith, Wingfield, Hinch Turner, Brandon, Green, Pritt, Hammersley, Kennedy. Straights alone: Messrs. Little, C. Wi H. Smith, Barlow, Daniel, Scaramanga, and Adam Half circuits alone: Mr. J. Wilson.

Instructors: Messrs. S. Summerfield and Brynild Machines in use: 35, 45 and 60 h.p. Caudrons.

Very little exhibition work was carried through d the week, mainly owing to the very bad wea Several good flights, however, were made by instructors.

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A few Pilots who have recently secured their Royal Aero Club Certificates at the Hall Flying School, Hendon.—(1) Mr. F. B. Taylor, (2) Mr. T. Dickson, (3) Mr. F. R. Rand, (4) Mr. H. L. Gaskell, and (5) Mr. A. Cosgrave.

THE R.F.C. INQUIRY.

When the R.F.C. Inquiry was continued at Westminster Hall on July 4th, the Chairman (Mr. Justice Bailhache) referred to a statement in one of the papers that General Sir David Henderson admitted there had been two cases of improper promotion, and that he (the Chairman) had added: "And a third." That, he said, was quite wrong. It was not admitted that there were two cases of improper promotion, but that there had been two alleged cases.

Mr. Balfour Browne said the suggestion of Mr. Pemberton Billing was not that the promotion was improper but was rapid.

Mr. Pemberton Billing agreed, and asked if he might supply the Committee with many instances of irregular reports to be cleared up in a like manner.

The Chairman: Don't. I do not want them. I did not want this one, but it was given to me, and I was obliged to refer to it.

The Chairman said that Lord Montagu was ready to bring certain mechanics to give evidence. He assumed that General Henderson's statement that pilots would not be prejudiced in their service career by giving evidence applied also to mechanics.

Sir David Henderson said that he had no objection, and the men would not be victimised. He suggested that he should be absent when the men gave evidence, and that he should be told what they said, but be given no names.

Major Sir Bryan Leighton, late lieutenant-colonel, R.F.C., called as a witness by Captain Bennett Goldney, M.P., said he had been flying since 1913, and joined the Royal Flying Corps in 1914. In May and June, 1915, he was at the front, attached to Headquarters. He came to the conclusion at the front that we ought to have had more and better machines. One never could have enough machines. As for their quality, the Morane "Parasol" was not a great success and the Voisin was afterwards discarded, though the French went on using them. A good machine in those days was the Nieuport. The sailors got most of them—the Navy had more money to spend. Very few Nieuports were ordered at that time for the Army. The squadron commanders at that time considered the B.E. 2 C. with R.A.F. engine the best they could get. He had been at the British Headquarters in Paris, where the naval wing of the air service was in charge of Flight Commander Thurstan, R.N.A.S., and the military wing was under Captain Valentine.

The Chairman: What were the relations between these two officers?—They were very strained while I was there. I found there was great rivalry in obtaining machines from French firms.

Were you friendly with both officers?—No. I scarcely spoke three words to Lieut. Thurstan. My information did not all come from Captain Valentine, because I heard it talked among other officers.

Mr. Bright: Was the ill-feeling entirely due to the rivalry with regard to orders?—Yes, I consider that was so. The Navy had more money to spend than we had, and I think that accounts for it entirely.

General Sir H. L. Smith-Dorrien: You mean that the Navy had a freer hand than you had in spending money?—Yes.

Replying to Captain Goldney, witness said that the Nieuport machines were not bought, because, according to gossip, the firm did not pay commission.

Mr. Shortt: Who was to get the commission? Capt. Valentine?—That was the report.

Mr. Butcher: The suggestion is, as I understand it, that an officer goes out to buy machines for the British Government, and does not buy them because he is not bribed. It is a shocking suggestion. Have you any foundation, beyond gossip, for it?—None.

You did not have it from any manufacturer—from the Nieuport people?—I was told, not by one person, but by several.

Did you have it from the Nieuport people?—They did not actually say so, but they inferred that in my conversation with them.

Mr. Bright: Do you think that that was the origin of the report?—No, I do not think so; I can only say that it was gossip.

Mr. Shortt: You did not seem to attach much importance to it at the time?—No, I did not; I did not go into it at all; it was not part of my business.

Sir David Henderson: You suggest that the rivalry between the Services was partly due to the Navy having more money to spend than the Army?—Yes.

Captain Bennett Goldney asked witness if discarded machines, which were known as "dud" machines, were being sent to the front for flying purposes when they were only useful for school purposes.

Witness replied in the affirmative, and said he had known of accidents to those machines.

Replying to Sir David Henderson, Sir Bryan admitted that he had not actually seen any of these "dud" machines sent home.

Sir David Henderson declined to accept the synonym that a "dud" machine meant a discarded machine, and contended that a "dud" machine was something quite different.

Captain Bennett Goldney contended that discarded machines were generally described as "dud" machines; it was not his suggestion.

Sir David Henderson: There is the discarded machine, but a "dud" machine is one that won't fly properly.

Sir Bryan Leighton asked whether he might say under what conditions he left the Flying Corps. He had no personal feelings against the Corps.

The Chairman: If you want to destroy a suggestion that has not been made, you can do so. If you wish to make a personal statement, I will listen to it.

Sir David Henderson said that if Sir Bryan insisted on going into the matter he should have to ask certain questions, and he suggested that it would have to be done in private.

The Chairman (to witness): Is it worth while?

The witness: I am in your hands.

The Chairman: No; I think it is not.

Lieutenant the Hon. Henry Lygon said that he had been an observer in the R.F.C. from January to May, 1915, and was afterwards in the ballooning branch, which he left because it made him sea-sick. He was now in the Yeomanry. He had a number of suggestions to make which were not grievances. As soon as an observer at the front got useful at the job he went home and learnt to fly, because only as a pilot could he get promotion. It was only since last autumn that observers had been part of the R.F.C. In order to give observers a proper position they should have been encouraged to remain by being given promotion. The alternative was to do away with observers altogether. Their duties were either reconnaissance, which might perfectly well be undertaken by officers of the Intelligence Department, or photography, which could easily be done by the pilot, or artillery spotting, which would be better done by artillery officers detailed for the purpose.

General Sir H. Smith-Dorrien: Artillery officers have their own duty, and if you use them as observers you will need to increase very largely the number available. I agree with your suggestion that unless an observer is in touch with the situation it would be difficult to obtain the right sort of report. I used always, in France, when an important reconnaissance was being made, to see the observer myself, so that he might intelligently reconnoitre the country and bring me back the information I wanted. That is what you mean?—Yes.

Would it not meet the case if the observers lived with the Intelligence Department rather than with the pilots?—Yes; that would bring them into touch.

In reply to Mr. Bright, the witness said there was something worth considering in the suggestion that observers should train as pilots, but he thought it a pity to take away observers who had become efficient in order to become pilots to get promotion.

Replying to Sir David Henderson, the witness said he was not aware that during the last six months the rule had been that an observer could be recommended for flight-commander. He knew that a very large proportion of observers wanted to learn to fly irrespective of pay or promotion.

Sir David Henderson's evidence was then resumed. He said that the finding of the Court of Inquiry into Lieutenant Tennant's accident was sent back because Lieutenant Tennant was not able in the first instance to give evidence. In the case of Second Lieutenant J. R. Chamberlain, killed in June owing to the wings of a B.E. 2 B. breaking in the air at Netheravon the first report of the Court of Inquiry stated that the wings broke in the air owing to abnormal strain caused by nose dive. The officer commanding the wing disagreed, and the machine was ordered to be re-examined, when it was reported that two cables had broken, which might have been caused by the air screw breaking in the air.

Mr. Billing: Is there any possible methods by which such accidents can be averted?—That is a very difficult question to answer. I do not think you can insure that such accidents can be averted.

You don't consider there was any negligence on the part of the inspection during building or flight?—No, I have no evidence but what is here.

Have the strains on the cable of such a machine been again worked out since the accident?—I do not think so.

If a second pilot was killed by the same kind of accident, would you go into the question of the strains on the cable again?—I should think very seriously indeed about it

Do you always wait until two men are killed before you take precautions?—I took all precautions, and the subject was carefully worked out, but if another man was killed I should very seriously consider what was the matter with the cable. The stress on the cable has been worked out before many times.

When two are killed you would consider the matter again?—It is not a matter of men being killed, but of an accident happening. I have no reason to believe that the cable broke under undue strain.

Sir Charles Parsons: I have been an engineer for many years, and no engineer would make the insinuation Mr. Billing is making. It is not right to make these insinuations. There is no evidence that the cable was overstressed. There is nothing, to my mind, to show anything wrong with it at all.

With regard to an Avro which was upset by a gust of wind when too near the ground to enable the pilot to recover control, Mr. Billing stated that the R.N.A.S. had discovered a remedy for this spin.

Sir David Henderson said that there was a certain amount of exchange of information between the Services, but he should not like to say that it was as complete as he could wish. He would bring evidence to show what interchange had taken place. The Avro was not an inherently stable machine.

The Chairman questioned Sir David Henderson about the case of Lieutenant Littlewood, who landed a new machine in the German lines at Lille. He said that, as he understood it, Lieutenant Littlewood started from Farnborough, where he picked up an observer to take with him—an observer who had been left behind and was disappointed in going over with some other pilot on some other machine. Was it a fact, when sending over new machines to France, that somebody went with the pilot as a fighting man?

Sir David Henderson replied that that was so.

The Chairman: Does the pilot choose his own companion, or is somebody allotted him for this specific purpose?—The proper course is that somebody should be allotted to him.

It is the duty of somebody, I suppose, to make that selection?—Yes, sir.

Would that, in this particular instance, be the duty of somebody at Farnborough?—Yes.

I am very much puzzled how this man, if he was not a trained observer, got into this machine?—I am very much puzzled also. There appears to have been some misunderstanding. Whatever I find out will be put forward.

Is it anybody's duty at Farnborough when a pilot goes to France in a machine to see him start?—Yes.

The duty of some superior officer?—It is the responsibility of the Officer Commanding the Administration Wing. If he, for any reason, cannot be there, he must depute the duty to another officer.

He cannot go there and pick up a machine and beckon to somebody else and say: "I am going to France, come along with me"?—He cannot do that.

And, I suppose, it is also the duty of somebody at the starting point to see the class of map with which the pilot is supplied, and also the general equipment of the machine, such as compass, &c.?—Yes.

The public proceedings at the sitting on July 5th opened with the calling of Capt. Valentine, R.F.C., as a witness. Replying to Sir David Henderson, he said he began flying in 1910, had flown in the circuits of Europe and Britain, had flown fifty different types of machine, and was still flying. He joined the R.F.C. at the beginning of the war, and in October, 1914, was sent to Paris to organise a department for the supply of machines and engines. He had to report to headquarters all machines and engines likely to be of use to the R.F.C. In cases where machines were thought suitable a pilot was sent from headquarters to test them. Orders to buy came from General Headquarters in the Field.

Sir David Henderson: It has been suggested that you recommended that the Nieuport machines should not be bought. Was that so?—No.

The Chairman: It has been suggested that you failed to recommend the Nieuport for purchase.

The Witness: I reported it as a good machine, as I did other machines. In some cases machines were bad, and I so reported.

The Chairman: Was there ever a question between you and the Nieuport people as to receiving a commission from them?—Never.

Did you ever intimate to them in any shape or form you would be prepared to take a commission?—Never.

Did they offer a commission or hint about it?—Never.

Did you take a commission from any other people?—Never.

Did you ever take a commission in respect of any machine you reported about?—Never.

What were your instructions with regard to your dealings with the Navy?—I was ordered to be on good terms with them, and to work in conjunction with their representative, and generally to see that we did not clash. I was not to compete in any way which would restrict the output or affect the Flying Corps in any way. It was arranged that the price at which machines should be purchased should be the prices fixed by the French Government.

Sir David Henderson: Did I give you any personal instructions about competition?—Yes, sir.

What were they?—I was not to compete, so that either the output of the Naval or the R.F.C. should be interfered with in any way, or that it should annoy the French Government.

The Chairman: Did any friction arise between you and Commander Thurstan as representing the Navy?—Commander Thurstan tried to get as much material as he could, even before the French prices were fixed and the competition became accentuated.

What were your personal relations?—I myself was always as friendly as possible with Commander Thurstan.

Did you complain to him about what he was doing to the disadvantage of the Flying Corps?—I very often spoke to him about it.

Did that lead to friction?—I don't think he quite liked me speaking to him.

Mr. Bright asked General Henderson if it was the custom for any commissions, secret or otherwise, to be offered to, or accepted by, officers in the R.F.C.?—Certainly not.

Replying to Captain Goldney, M.P., the witness said he understood that when his report on the Nieuport machine was made it was found that the firm was very busy with orders from the French Government, and that the latter were reluctant to the Flying Corps or the Navy having machines delivered to them from that source, as their requirements were so numerous.

M. Baszaine, one of the managing directors of the Nieuport Company, was called, and emphatically denied that there had ever been any conversation with Captain Valentine with regard to the payment by his firm of a commission to him.

General Smith-Dorrien said he thought that Major Sir Bryan Leighton should make a public apology to Captain Valentine.

Mr. Butcher: It was a gross charge, but he did not put it forward as a direct charge so much as the result of gossip.

Mr. Shortt added that Sir Bryan Leighton did not make the statement voluntarily; he was asked about it.

Mr. Balfour Browne: It is rather our fault that the statement was allowed to be made, because Sir Bryan distinctly stated it was gossip.

The Chairman: We are all agreed—and I am very pleased to state it publicly—that we are perfectly satisfied with Captain Valentine's very clear statement, and we have not the slightest doubt that the story has not the slightest foundation.

Captain Noel Sampson was called to speak to the accident to Major Penn Gaskell on January 31st, on the occasion of a Zeppelin raid. Orders were received from the War Office to send up pilots if the weather permitted. Major Gaskell told the witness not to go up until he had had a "chucker" round first. Major Gaskell had been up at night very often on the same type of machine—B.E. 2 C. He believed that Major Gaskell got into the low mist and lost sight of the flares. He caught the tops of some trees, which brought him down.

Captain W. R. Barker gave confirmatory evidence.

Mr. Billing inquired as to the system of lighting of the ground.

The Chairman ruled that the question could not be put in public.

Mr. Billing protested, and asked how the charge of negligence could be investigated if these details were not gone into. This accident happened six months ago, and the information could be of no value to the enemy.

The Chairman said that he had given his ruling on the point, and invited Mr. Billing to proceed with his cross-examination.

With regard to the death of Major Unwin, Captain Valentine was recalled, and said that he taught him night flying. He was a quite qualified night pilot, and a very courageous man.

Staff-Sergeant Stubbins said that Major Unwin hit a tree on a B.E. 2 C. The machine caught fire. There was a slight ground mist, but he could see the machine 400 ft. overhead. He did not think there was any danger from the fog that night. The flares were quite clear.

Sir David Henderson then dealt with the case of Captain Warren, who was alleged to have been shot down because the machine could not climb fast enough. Captain Warren with two others went before daylight on a bombing expedition well within the enemy's country. It was foggy, and the pilot had to descend very low to accomplish his object.

The objective was well protected by anti-aircraft guns, and the result was that Captain Warren was shot down and his leg broken. He had been mentioned in orders for his gallantry.

Mr. Billing asked if it was absolutely necessary that Captain Warren should be sent on this particular expedition that morning.

Sir David Henderson replied that it was not absolutely necessary, but in the opinion of the Higher Command it was necessary. He considered the machine used was the most suitable for the work.

The Chairman said it did not seem to be a question of the machine, seeing that the pilot was shot down from a low altitude, which was necessary for him to carry out his objective.

Mr. Billing contended that it had everything in the world to do with it.

The Chairman replied that they would not argue the point.

Sir David Henderson said he had never admitted that he would not under certain circumstances refuse to send up a pilot. In regard to the second fatal case Sir David Henderson said the accident was not due to a defect in the machine, but to the explosion of a hand-grenade, and the machine fell within our lines.

Replying to Mr. Billing, Sir David Henderson said that pilots were at one time allowed to carry hand-grenades without permission, but he rescinded that order. He could not say whether this was prior to the accident or not, but he did not recollect that there was any evidence of disobedience, and probably Captain Hughes had authority to carry grenades.

The Chairman intimated that they had now arrived at a point when Sir David Henderson's evidence should be taken *in camera*. But before doing that they would permit Captain Bennett Goldney or Mr. Pemberton Billing to ask any questions on the specific cases which he had dealt with in public. If they wished they could reserve any questions until Monday, and in the meantime they could consider what questions they would wish to ask.

Mr. Billing asked whether he would be allowed to be present while General Henderson was giving his evidence *in camera*.

The Chairman: No, there are matters which only concern the Commission on which we desire to examine the witness.

Mr. Billing: General Henderson was present during my evidence *in camera*.

The Chairman: All your specific allegations have been dealt with in public in the evidence given in your presence, and you will be permitted to ask questions on these.

Mr. Billing said he would like to hear if any reference was made to himself personally.

The Chairman said they had had a most exhaustive examination as to all allegations which Mr. Pemberton Billing had made, and he (the Chairman) would take care that any further reference to these would be duly considered.

Mr. Billing said he had sufficient questions to last a whole day.

The Chairman: If you ask any now you will not be allowed to ask them again on Monday.

Mr. Billing said he would reserve his questions until Monday.

Sir David Henderson said, in reply to Mr. Bright, that he had taken a full course of engineering at Glasgow University before he joined the Army, and for ten or twelve months he was in Lord Kelvin's laboratory. He had been employed for twenty months in the Royal Engineers building defences at foreign stations, and from then until he became interested in aeronautics, in 1911, he had had no further practice or study.

In reply to a question by Mr. Bright, the witness said that there would always be most violent differences of opinion between pilots in the matter of design. With regard to Mr. Bright's suggestion that it might be good to have an Ordnance Board for choosing machines similar to that at Woolwich for choosing guns, Sir David Henderson pointed out that we had dealt in artillery for centuries, and there were not in existence in this country, to his knowledge, the *personnel* for forming such a Board as was suggested. Since Mr. Billing had referred to the fact that he (General Henderson) had never flown over the enemy's lines, he should like to state that when he went to France he was personally forbidden by the Field-Marshal commanding ever to go up over the lines so long as he was in command. Lord French could be called to corroborate that statement.

Mr. Billing said there was nothing personal in the comment which he had made. He had been obliged to ask the question.

The Committee then continued the sitting in private, and held sittings on the three following days.

At the resumption of the public sittings on July 10th, the Chairman explained that the Committee had been sitting *in camera* for the past days to hear evidence partly from General Sir David Henderson, about matters that it was thought it would not be wise to take in public, and also from several gentlemen who were members of the Flying Corps, who had a natural reluctance to come forward in public so that their names would appear. There was a fear that it might have a damaging effect on their careers. Their evidence was taken in the absence of General Henderson.

While *in camera*, one or two cases that had been made the subject of charges in public were mentioned, and these would be dealt with in public. The two most important instances related to charges in reference to accidents that had happened to flying men—charges in particular by Mr. Pemberton Billing.

The first case was that of Lieut. Brock, killed at Birmingham. The charge was that the machine made a spiral skim and nose-drive, and the suggestion was that the reason of that was because it was a B.E. 2 C machine, and because it was said that that was the way these machines had a habit of behaving. As a matter of fact, according to the evidence before them, the machine was not a B.E. 2 C at all, but an Avro.

Mr. Billing: I distinctly stated in the House that I could not give the name of the machine.

The Chairman: I am confining myself to what you said in the House.

Mr. Billing: Did I say that it was a B.E. 2 C?

The Chairman: You said it sounded like a B.E. 2 C, because that was the way the machine behaved.

Mr. Billing: I did not say that it was, but that the accident sounded like a B.E. 2 C.

The Chairman added that the other case was that of Lieutenant Downing, killed at the Central Flying School. This was a case again of a nose dive, and into the accident there was the usual inquiry. The finding was that Lieutenant Downing lost his life owing to the machine nose diving and striking the earth. The machine was in proper flying order, and the engine running satisfactorily. The controls were intact and in working order at the time of the accident. There was no evidence to show why the machine should nose dive. It was a B.E. 2 B., which was not a stable machine.

Mr. Pemberton Billing said he had said that this machine made the usual B.E. spiral. He did not say either that it was a B.E. 2 C. or a B.E. 2 B. Was he to understand that this statement was unjustified?

The Chairman: You are to understand neither one thing nor the other. I am only telling you the evidence given *in camera*, and I am reading it out because it was a piece of evidence which should have been given in public. I really thought that I had made that quite clear.

Sir David Henderson was then cross-examined by Mr. A. Lynch, M.P.

Mr. Lynch: Are you content with the present output of aeroplanes?—No.

In what direction do you think there might have been more efficiency?—I should like to see a better all-round efficiency.

In what direction do you find deficiencies?—I do not find particularly any deficiencies, but I should be glad to have more.

Machines, pilots, and, in fact, everything?—Chiefly engines.

Do you think that in any circumstances, and with the very best possible organisation, and with the greatest energy of work, it would have been possible that we should have at the present moment 20,000 aeroplanes?—No, I don't think it possible, because you have got to have engines, mechanics, and pilots as well as machines.

Do you think any scheme could have been devised if that object were kept steadily in view with the determination on the part of everyone concerned to realise it, to train the requisite number of pilots?—No.

That being so, could you put your finger on the main obstacle against the realisation of such a project?—There are various obstacles, and I do not know I could call the provision of pilots a serious one. There is the provision of mechanics—with the competition of munitions, &c.—the provision of engines, and certain parts of the aeroplanes are difficult to buy in quantities for the same reason.

Asked as to whether in the case of an inventor producing plans of a proposed new machine a communication would be sent that the Government would do nothing until the machine was produced and had been flown by him, witness said that in certain cases that would be done. Unless there was a fair chance of an invention proving valuable they had no time to go into the matter. If a struggling inventor wanted information he could go to the National Physical Laboratory and get it. Extremely good ideas had come from private firms, but he could not say whether they were under Government control. He denied that the attitude of the Government had been to refuse help until inventors were in a position to show that they had no need of help at all. He thought experiments with large machines ought not to be abandoned.

Mr. Lynch named a private firm whose activities, he alleged, had been hindered by "back-stairs policies."

The witness said that one of the directors of the firm would be called.

Mr. Lynch: Is there now a British machine superior to the Fokker?—Yes, there are British machines at the front superior to the Fokker.

Since when have they become superior?—At the start we had machines equal to the Fokker, and about February or March this year we had a very large number of superior machines to the Fokker.

Was the Fokker machine first offered to this country?—No, not the first; but I sent two officers over to Holland to see it, and their report was very unsatisfactory. The designer of the Fokker did not improve his machine until the war was pretty well under way.

The designs were all very bad until the inventor copied the Morane.

Was there no time when the Germans had an incontestable superiority at the front on account of their Fokker?—No. Never.

Was there never a period when the number of British machines brought down by the Fokker was greater than the number of German machines brought down by us?—Yes; but not very much greater. But that does not prove any superiority.

What was that due to?—To a difference in methods employed. We were doing the work of the Army and the Germans were not; they were trying to stop us from flying over their lines.

"There's no harm in saying now," added General Henderson, "that we first began aerial artillery observation when we reached the Aisne, after the battle of the Marne. Before then we did nothing."

Captain Bennett Goldney, M.P., next took up the cross-examination, quoting a remark by General Henderson to the effect that dropping bombs over towns was opposed to the ethics of war. The witness replied that he no more expected bomb-dropping for other than military reasons than he expected poison gas or other things that the German had used.

General Smith-Dorrien pointed out that Captain Goldney said on June 27th that a grave charge against the administration of the R.F.C. lay in the issuing of instructions to officers that they were not to supply information to members of Parliament. He wished to know whether General Henderson ever issued such an order?—Sir David Henderson: Never. He had never heard of the order. He thought all officers on the home stations were advised not to give information, but that was not specially directed against members of Parliament.

Capt. Goldney said that his information was that the order was issued by a colonel at the War Office, and that young officers were warned that if they did give information it might prejudice their advancement.

Mr. Pemberton Billing intimated that he had several questions to put to General Henderson. He asked if a certain very highly placed officer, in reply to a question by a member of the Committee about the B.E. 2.C, said that she was a very suitable machine at over 1,000 ft. What do you think he meant by that?

Sir David Henderson: I do not know that he said it. I do not know what you are talking about.

Questioning General Henderson as to the statement that it was against his personal wishes that he took over the command of the R.F.C., as he thought a younger man, more in touch with practical aspects of flying, should occupy the position, Mr. Billing asked: "Who do you think is the best judge of a man's fitness?"

The Chairman: That is not a question he can answer.

Mr. Billing: I suggest that it is best left to the man himself.

General Sir H. Smith-Dorrien: It is not everyone who makes a habit of blowing his own trumpet, Mr. Billing.

Mr. Billing: Surely.

Sir David Henderson, answering further questions, said that he encouraged the development of high-power engines long before the war. He characterised as "grossly untrue" a suggestion that he placed orders for Aircraft Factory machines which were greatly inferior to designs by private firms. He had long been of opinion that an experimental base, such as that in France, would have been useful, but he thought they would now be able to work on their present lines.

"Can I call evidence to rebut Mr. Billing's statements?" asked Sir David Henderson later. "He is giving evidence again."

The Chairman: The difficulty is that Mr. Billing is not used to putting questions, so we must allow him quite an unusual latitude.

In regard to the relative advantages of Government machines and privately-made machines, Mr. Billing asked Sir David Henderson if he would be convinced by the evidence of pilots as to superiority of privately-made machines.

Sir David Henderson: I have far better chances of being convinced by pilots than you have, Mr. Billing.

Was there any time when our superiority had been challenged?—Not successfully. Our pilots had always been able to carry out the work of the Army to the satisfaction of the Commander-in-Chief.

But with extreme loss to our men and machines?—Not extreme loss.

Would the loss have been less if we had had better machines?—Possibly, but not certainly. If we had had more machines we should have done more work.

Have any of our men had to engage the enemy with slower machines?—Yes.

Are the fighting machines we are at present employing as fast as the enemy's?—Yes.

The F.E. 2, for instance; is that as fast as the new biplane Fokker?—No. Even fighting machines have to be put into classes.

Would it surprise you if I tell you that the biplane Fokker can climb the first 10,000 ft. in, possibly, 10 mins.?—I should be inclined to doubt it.

Its speed at 1,000 ft. is about 109 miles an hour?—Possibly, but not probably.

The Chairman: Is not an effective reply the performances of our aeroplanes at the front during the past week? We apparently now have a complete mastery of the air at the front. That does make these questions of a rather academic interest.

Mr. Billing explained that most of his references were to six months ago, not to to-day. He had no doubt that as we are now employing better machines, our performances at the front are rapidly improving.

Mr. Billing asked if the Committee were not, prior to the inquiry, conducted round certain aerodromes.—Yes.

One staff officer was told off to each member of the Committee?—That is not right.

Mr. Butcher: Speaking for myself, that is quite untrue.

The Chairman: It is really too funny.

Mr. Billing: I am asking for information.

The Chairman: Well, do not ask silly questions like that.

The Chairman intimated that he wished to make public replies to two further questions raised in private. There was no truth in the statement that 74 pilots were brought back from France for further training. The criticisms with regard to the unsuitability of one of the landing grounds for pilots were, in substance, correct, but another ground of more ample dimensions had been, or was being, obtained.

Mr. Billing went on to ask General Henderson about the opinion he once expressed, that the dropping of bombs here and there over London was opposed to the ethics of warfare.

Sir David Henderson said he had anticipated that the only time the enemy would be able to raid efficiently was by day.

Mr. Billing: You never thought Zeppelins would use the night time?—No; but I thought they would not come to this country to drop bombs promiscuously on inhabited parts of the country, because I thought the German was a civilised person. He has proved that he is not.

At one time considerable difficulty was experienced by persons calling at the War Office for interviews. I have that on very good authority.—I am afraid I cannot accept the statement on that ground. What authority?

He is sitting before you now. I am the authority.—Are you the authority?

Mr. Billing asked Sir David Henderson if he was in favour in his reports to the Committee of Imperial Defence of the development of the rigid airship.

The Chairman: You must not ask a question concerning a confidential report.

Mr. Billing: Then General Henderson is not to answer that question?

The Chairman: No.

Mr. Balfour Browne: The Committee are in a position to answer that question because they have the report before them.

Mr. Billing: Perhaps the Committee will answer the question then!

Mr. Balfour Browne: We are not being cross-examined yet, Mr. Billing.

Mr. Billing asked Sir David Henderson if he would state the salary of a certain high officer in the air service. Sir David declined.

The Chairman: We are not going to inquire publicly into a man's salary. I may say we are not going to inquire privately into it either, Mr. Billing.

The Chairman proceeded to refer to other matters which had been considered *in camera*. With regard to a Zeppelin raid in January, he said the evidence showed that thirteen machines ascended, seven were damaged, four pilots were injured, and two (Major Penn-Gaskell and Major Unwin) were killed.

Mr. Billing resumed his cross-examination of General Henderson, and asked him if he did not find it difficult to decide on questions connected with the design of engines at the R.A.F.?—Yes, all my work is difficult.

Aeroplanes are frequently damaged through being unable to get out of range of gunfire?—That is quite untrue.

What proportion of British-built machines were employed by the Army when war broke out?—More than half were British-built, but only a small number of engines were made in England. None was of English design.

Mr. Billing said that Sir David had persisted in ordering machines that were inefficient.

Sir David Henderson: I cannot allow that to pass. The idea that a machine is necessarily superior because it is faster and climbs better I cannot admit for the moment. For war purposes there is very much to be considered. If I am going to get a machine with a speed of 120 miles an hour and capable of climbing 1,000 ft. in five minutes, it is a very nice machine, but if it breaks away every time it goes up or has to be flown by a special pilot, it is useless. The only point about the superiority of machines is success in beating the enemy.

Mr. Billing asked Sir David if he was not in a position, before the war, to influence the Treasury to make grants to develop aviation.

"Far from it." He spent the money voted for aviation, he added, in the way he thought best.

Mr. Billing: Then you are not to blame for our unreadiness?

Mr. Billing was occupied for some time in reading through his notes, and apologised for keeping the Committee waiting. "I have had certain military duties to attend to in the interval," he said, "and they have rather interfered with the preparation of my papers. I should like my further cross-examination postponed."

The Chairman said they could not ask General Henderson to attend again.

Mr. Balfour Browne: I understand that the only military duty you have performed is to receive 2*s.* 9*d.*?

Mr. Billing: Two shillings and sevenpence, sir. He protested against the Committee's decision, and said he had about 200 pages of evidence to go through.

The Chairman said the Committee were not responsible in any way for other things that had caused Mr. Billing to be unprepared, and while they regretted that anything should militate against the preparation of his case, they must proceed with the inquiry.

The Committee then sat in private, and afterwards adjourned till the following morning.

* * * *

AVIATION IN PARLIAMENT.

The Lost Aeroplane.

Mr. Gwynne, on July 4th, asked whether a flying machine of the latest type was recently sent from Farnborough to France in charge of a pilot who had never been abroad before; whether the officer informed the authorities beforehand that he did not know his way; whether he lost his way and eventually landed by mistake in the German lines; and, if so, what steps, if any, have been taken to avoid our newest machines being handed over to the Germans within a few hours of completion?

Major Baird (representing the Air Board): The facts are as stated, except that from the inquiry held it does not appear that any protest was made by the officer in question. The circumstances under which the incident occurred are as follows:—A batch of machines of a well-known type had been fitted with a new type of engine. These machines were urgently required at the Front, and a number of officers were detailed to take them over to France. Some of these officers had done the journey before, others had not: all were qualified cross-country pilots trained to fly the type of machine in question. The particular officer referred to graduated as a pilot for this type of machine after thirty-two hours' flying, which is considered an ample amount. His report showed him as efficient and a good cross-country flier. The need for machines in France is so great that it is impossible to keep them back until officers are available to fly them over who have previously done the journey, which, moreover, is not considered a difficult one for a trained cross-country pilot. To take a machine across is an ordinary incident in a pilot's duties, and as many as twenty-four machines have gone over in one day lately. Such regrettable incidents have occurred to the Germans also, who recently presented us with a brand new Fokker. There is no means of avoiding them altogether in war times, but every care has been taken and will continue to be taken to reduce the risk of their occurrence to a minimum. The pilot in this case evidently lost his way, and it appears from a letter received by his parents from him that his machine was hit and rendered unmanageable by fire from the ground as he was descending. Otherwise, on discovering his mistake, he might have got away.

Mr. Ashley: Was the pilot supplied with the usual map, or was it an out-of-date map?

Major Baird: I anticipated some curiosity on that point, and consequently I have taken the precaution of providing myself with a copy of the map, which I shall be prepared to show to my hon. and gallant friend. It is the Ordnance Survey map as used by the general staff and supplied to pilots.

Mr. R. Gwynne: Will the hon. and gallant member say whether there was an observer on board, and, if so, had he any experience of the route?

Major Baird: Yes, sir, there was an observer on board, but he had no more experience of the route than the pilot. It is not a question of knowing the route any more than you can expect the man who takes a ship to New York to know the road to New York. It is a question of knowing the navigation. This pilot was qualified as an aerial navigator, and he should have had no difficulty in finding his road.

Mr. MacCallum Scott: Was the passenger an observer, or simply a passenger?

Major Baird: I should like notice of that question.

The R.A.F. Report.

Mr. Ashley, on July 5th, asked whether the Committee appointed to inquire into the working of the Royal Aircraft Factory at Farnborough has concluded its investigation; and, if so, when will the Report be published?

Major Baird: The Committee has concluded its investigation, and its report will be laid before the House at an early date.

Enemy Air Raids and Railway Employés.

Mr. Thomas asked the President of the Board of Trade whether he is aware that the agreement made by him with the Railway Executive Committee whereby the railway companies under their control should compensate men injured by hostile air raids or bombardment on the same basis as that on which compensation is payable under the Workmen's Compensation Act has not been made retrospective so as to cover the cases where such injury had already occurred; and whether, therefore, he will take the necessary steps to extend this measure of justice to all men who have suffered such injury whilst following their employment?

Mr. Harcourt: I will communicate with the Railway Executive Committee on this point, and inform my hon friend in due course of the decision arrived at.

Why Names of R.F.C. Pilots are Withheld.

Mr. R. McNeill asked the Secretary of State for War who were the British aviators who succeeded in bringing down the German, Captain Immelmann, and why their names have not been already published?

Mr. Forster: It is not customary to mention in *communiqués* the names of officers or soldiers who perform acts of gallantry, and it is not considered desirable that an exception to this rule should be made in the case of officers of the Royal Flying Corps. The Commander-in-Chief mentions in his despatches the names of those whose actions or services justify special mention.

The Government Aircraft Insurance Scheme.

Mr. Wing, on July 6th, in the House of Commons, asked the President of the Board of Trade if it will be possible to reduce the premiums of air-raid insurance?

The First Commissioner of Works (Mr. Harcourt): As stated, in answer to a question by the hon. member for Blackburn on May 24th, the aircraft insurance scheme, which came into operation in July last, has at present money in hand, but that position may change at any moment. It is not proposed to increase the rates, but it would not be wise to reduce them.

Mr. Tickler, on July 10th, asked the President of the Board of Trade if he is aware of the hardships suffered by residents on the East Coast, by reason of their having to insure against aircraft raids and bombardment risks; and if he will grant them the privilege of being allowed to pay their insurance premiums by half-yearly or quarterly instalments, as the payment of the full yearly premium presses hardly upon the class of people residing in these districts?

Mr. Harcourt: While I sympathise with the hon. member's desire to make the payment of aircraft insurance premiums as easy as possible, I fear that it would not be possible at this stage to arrange for the annual premiums to be paid in instalments. The premiums are very small, and any system of payment by instalments would increase the working expenses out of all proportion.

Mr. Hogge: Why does not the Air Risks Insurance give the usual days of grace for the repayment of the premium?

Mr. Harcourt: That is rather a complicated question. I have already explained the matter to my hon. friend.

Sir Leo Chiozza Money asked what the Aircraft and Bombardment Insurance Fund amounts to; what has been paid out of it to the insured; what proportion of it has been absorbed by expenses and the commissions of the various insurance agencies; and what is the number of insured persons or firms, so far as the particulars are available, and the latest possible date?

Mr. Harcourt said that the number of policies issued under the Government Aircraft Insurance Scheme up to the end of March, including those issued through the Post Office, was about 1,884,000. In the case of insurances effected through an approved company, a remuneration of 10 per cent. of the gross premium is paid to the companies. In addition, a commission of 5 per cent. is paid to agents. The other figures could not be given.

THE FLYING SERVICES FUND—ADMINISTERED BY THE ROYAL AERO CLUB

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to July 4th, 1916 ...	10,750	0	4
Collected at the Westland Aircraft Works, Yeovil (Thirty-ninth contribution)	0	17	7
Employés of Ruston, Proctor, and Co., Ltd. (Ninth contribution)	1	10	0
Offering from a Church of England Service of Holy Communion of the Royal Flying Corps, S. Farnborough	1	4	0
Total, July 11th, 1916	10,753	11	11

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

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PERSONALS.

UNDER the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Flight-Lieutenant J. L. P. ARMSTRONG, previously reported missing, is now stated to have died of wounds. He was the only son of Mr. John Lewis Pasteur Armstrong, of The Bury, Felsted, and of Mrs. Armstrong, of North House, Dunmow. Educated at Felsted, he was afterwards a pupil of Messrs. Vickers, Sheffield, for five years. At the outbreak of war he joined a unit of Mechanical Transport. Later, he was transferred to the Royal Flying Corps, and, gaining his "Wings" about six weeks ago, he was sent to the Front. His commanding officer wrote: "He had just distinguished himself greatly by destroying a Fokker behind the German lines. He is a splendid fellow, and was very popular in the squadron. I always looked upon him as one of the most gallant of my pilots, who could be relied upon to do anything."

Captain GEOFFREY GASKELL BLACKBURN, West Yorkshire Regiment, whose death is announced, was the second son of Mr. H. Gaskell Blackburn, Bank House, Horsforth, a member of the firm of Messrs. H. W. and J. Blackburn, accountants, Leeds. He was a brother of Flight-Lieutenant Vivian Gaskell Blackburn, who took part in the air raid on Cuxhaven and during the destruction of the "Königsberg" in East Africa. He was 27 years of age, and joined the regiment at the beginning of the war.

Second Lieutenant SHARP, who has been killed in action, was the youngest son of Mr. and Mrs. T. Sharp, of Oakdale, Leamington. Originally a member of the Royal Flying Corps, he transferred to the Lincolnshire Regiment, and had been in France about eighteen months. Before enlisting on the second day of the war, he was on the staff of the London City and Midland Bank at Moreton-in-the-Marsh. Lieut. Sharp was educated at Grantham School.

Second Lieutenant REX SHERWELL, R.F.C., killed on July 3rd, aged 18, was born September, 1897, and was educated at Tonbridge School. He was captain of the cricket eleven 1915, and played for Lord's *v.* The Rest in that year. He received his commission in the Lincolnshire Regiment in October, 1915, and was gazetted to the Royal Flying Corps in May last. He was the tenth son of Mr. and Mrs. T. Yeo Sherwell, of 40, The Avenue, Brondesbury, and brother of P. W. Sherwell, the South African cricket captain.

Second Lieutenant CHARLES THOMAS HINTON VAISEY, R.F.C., who died of wounds on June 30th (received while flying over the German lines the previous day), was the eldest son of Dr. and Mrs. Vaisey, of Winslow, Bucks. He was 30 years of age, and was educated at Trent College, Derbyshire, and was sheep-farming in Australia when war broke out. He came home a year ago in order to join the Flying Corps. His two brothers are also serving in France. In a letter written to his father, the Observer—who was with him at the time he was wounded, and whom he brought safely back—says: "He was badly hit almost in the first burst of fire from the three hostile machines which attacked us. At first I thought he was all out—but somehow he pulled himself together and brought the machine some eight or ten miles back to the aerodrome, where he made a perfect land. God knows how he did it—for he was in awful pain."

Lieutenant HAROLD LEGH WALLIS, R.F.A., attached R.F.C., who was killed while flying on July 2nd, aged 22, received his commission in the R.F.A. in April, 1915, and was attached to the Royal Flying Corps last January. He was educated at Repton and the Royal School of Mines, Kensington. He was the youngest son of the late William E. Wallis, A.R.I.B.A., of Caterham, and of Mrs. Wallis, residing at 2, Vicarlands, Moffat, Scotland.

Married and to be Married.

The marriage of Lieutenant C. E. CHARLTON-ANNE, R.F.C., son of Major Anne, of Burghwallis Hall, Yorks., to Miss A. C. E. MILLER, only daughter of the late John Alexander Miller, of Edinburgh, took place at St. Mary's Church, Cadogan Gardens, on Thursday, July 6th. The bridegroom was attended by Lieut.-Col. L. E. O. Charlton, C.M.G., D.S.O., of the Royal Flying Corps, as best man. In the absence of the bride's brother—Lieut. W. J. A. Miller, R.F.A. (Canada), who is serving on the Canadian Staff in Flanders—the bride was given away by Mr. S. Greenlees. She was attended by Miss Phyllis Holman as bridesmaid, and Sir Richard Levinge, Bart., as page. A large number of guests were present at the church and afterwards at the reception given at 8, Wilton Place, S.W., by Capt. R. C. Rome, R.F.A., and Mrs. Rome—the house being kindly lent for the occasion by their uncle, Mr. S. Greenlees.

Items.

Second Lieutenant W. D. M. BELL, R.F.C., who has just been mentioned in despatches—as recorded in "FLIGHT," July 6th—is a member of a well-known Scotch family, and, together with two of his brothers, fought in the Boer War. Subsequently, he found an outlet for his roving disposition in big game shooting in East Africa, where he owns some property. He is one of the best known big game hunters in the world, and is a marvellous rifle shot. When war broke out he was up country on a shooting expedition in the French Congo, but immediately he heard of the outbreak of war he returned and took up flying, and for some time was stationed at Castle Bromwich. His interest in flying was first aroused by the reports which reached him in East Africa of Paulhan's flight to Manchester, and he cabled home to Coventry, asking that an aeroplane and a large quantity of petrol should be sent out to him. He was informed that considerable tuition would be necessary, so came home for this, and attended at a flying school for some months at a time when pupils received only a few minutes' flight every month. This was not good enough for him, so he went back to Africa again. He knows most of the country and languages of East Africa.

Second Lieutenant McCubbin, who was responsible for bringing down Immelmann, the crack German air pilot, is only 19 years of age, and is the son of Mr. David A. McCubbin, of Johannesburg, and a grandson of Mr. James T. McCubbin, of Bootle. He joined the R.F.C. this year as mechanic, but obtained rapid promotion. He was educated at Johannesburg College. He endeavoured to join the forces in South Africa at the beginning of the war, but the authorities at Cape Town refused to take him on account of his age. Subsequently, his father gave him permission to come to England to join the Royal Flying Corps, which he did in February. After flying at Hendon and other places in this country, he went to France about two months ago, and had the luck to come in contact with Immelmann, with the result already known. After he had despatched Immelmann, Lieutenant McCubbin was wounded, and is now in hospital in England, where he is reported to be progressing favourably.

Through the War Office and the help of the American Ambassador, a gold cigarette case—which was in the possession of Second Lieutenant R. BARTON, of the R.F.C., when he was killed in aerial combat and fell within German lines—has been restored to his father, Mr. A. E. BARTON, of Red Court, Carnforth, Lancs.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *British Headquarters (France), July 4th*, 10.55 *p.m.*

"Yesterday our bombing aeroplanes successfully attacked the important railway centres at Comines, Combles, and St. Quentin. Our offensive patrols, working far into the enemy's country, encountered hostile aeroplanes in great numbers, and much fighting took place. Four of the German machines were brought down in their own lines, and at least three others were driven to the ground damaged. We have suffered no further losses beyond those already reported."

British Headquarters, July 6th, 9.30 *p.m.*

"Low clouds have interfered with aeroplane work, but in the Bapaume area one of our machines, dropping to an altitude of 300 ft., successfully bombed a train from which German reinforcements were alighting."

British Headquarters, July 7th, 8.44 *p.m.*

"An officer prisoner states that his battalion came under strong machine-gun fire from one of our aeroplanes at an altitude of 300 ft. when marching to the battlefield, and that shortly afterwards the same battalion was shelled heavily by our long-range guns."

General Headquarters, July 8th, 11.12 *p.m.*

"Despite the cloudy weather, our aeroplanes and kite balloons did some useful work taking photographs and directing the fire of our batteries. A large explosion was caused in one of the enemy's ammunition depôts, and bombs were dropped on his billets.

"One of our machines, although disabled, sustained a running fight for twenty minutes with three hostile aeroplanes, and afterwards landed safely in our own aerodrome.

"With this exception few enemy machines were seen, and these were far behind his own trenches."

General Headquarters, July 8th, 12.20 *p.m.*

"Despite the unfavourable weather, our aeroplanes rendered valuable service. In addition to active co-operation with the artillery and important reconnaissance work, they bombed the hostile aerodrome at Douai, completely wrecking a hangar and doing other material damage."

General Headquarters, July 10th.

"Yesterday the Royal Flying Corps carried out several successful bombing attacks against various detraining centres, ammunition depôts and aerodromes.

"Numerous combats took place in the air, as the result of which one German machine was destroyed and several others were driven to the ground in a damaged condition."

French. *Paris, June 4th. Afternoon.*

"North of Frise yesterday one of our aeroplanes set another German captive balloon on fire."

Paris, July 4th. Evening.

"Our airmen last night bombed Longuyon Station, camps at Challerange (Eastern Champagne) and Savigny, and military depôts at Laon (south-east of Péronne)."

Paris, July 6th. Evening.

"During the night of July 5th–6th a group of our bombardment aeroplanes dropped numerous shells on the railway line from Ham to Nesle. Fires broke out in the stations of Ham and Voyennes. The line was damaged in several places."

Paris, July 7th. Afternoon.

"Yesterday German aeroplanes dropped several bombs on the open town of Lure. Eleven persons were killed and three wounded. With the exception of one soldier wounded all the victims were women or children. Note has been taken of this attack in view of reprisals.

"Yesterday one of our air squadrons successfully dropped 40 bombs on the railway junction of Lam-les-Moines, west of Charleville. During the return flight our escorting machines made numerous attacks on German aeroplanes. Two German aeroplanes were brought down, one close to Mezières and one in the district of Leffincourt."

Paris, July 9th.

"In the *communiqué* of July 7th the German Staff gives statistics of the losses sustained by French aviators which are absolutely incorrect. During the month of June it is claimed that the Germans lost seven machines and the Allies thirty-seven. Now the number of French aeroplanes that have not returned is fourteen. During the same period eighteen German machines were brought down, and seven others seriously damaged."

Paris, July 10th.

"This morning an enemy aeroplane of the Aviatik type was found in our lines. The machine came down during the night of July 6th in the course of a raid. The body of one of the two occupants was found buried under the wreckage, and two bombs left in the machine were destroyed."

Paris, July 10th. Evening.

"In the region of the Somme our chasing aircraft yesterday attacked numerous German machines. Four of the latter were driven down in the enemy lines. During the night of the 9th one of our bombarding squadrons dropped a large number of bombs on the railway stations of Ham and Polancourt."

Russian. *Petrograd, July 4th.*

"Our air squadrons carried out a raid on the railway station of Baranovitchi."

Petrograd, July 5th.

"An enemy aeroplane which threw bombs on our ships was brought down by our aviators. The enemy pilot and mechanic were made prisoners. As the result of a second encounter between our aeroplanes and those of the enemy we brought down another German aeroplane, which fell on the coast. One of our aeroplanes was brought down, and we lost the pilot, Second Lieutenant Izvekoff, and the mechanic, Nazaof, died heroically."

Petrograd, July 6th.

"Yesterday hostile aeroplanes flew over Minsk and dropped thirty-one bombs, wounding three men, seven women, and two children."

Petrograd, July 10th. Afternoon.

"On both sides aircraft are making numerous flights along the whole front. In the region of the Shubinsky Canal, east of the confluence of the rivers Berezina and Niemen, our artillery brought down a German aeroplane, and we took prisoners the airman and mechanic.

"No less than 10 enemy airmen flew over Molodetchno, and dropped 40 bombs, and set fire to a haystack, which was destroyed."

Petrograd, July 10th. Evening.

"In the neighbourhood of the village of Ivanovka, north of Kashovka, two squadrons of enemy aeroplanes dropped about 70 bombs on our ambulances, wounding two sisters of mercy and a delegate of the Red Cross."

Italian. *Rome, July 4th*

"An Austrian aeroplane was brought down by our artillery fire on to the Asiago plateau, the occupants being taken prisoners."

Rome, July 8th.

"Our aircraft bombarded the enemy's positions and columns south of Calliano, in the Adige valley and in the Upper Assa valley, returning safely."

Rome, July 10th.

"Between the Adige and the Brenta the artillery as well as the air services were active.

"Enemy aircraft dropped bombs on Cittadella, and on some places in the lower Isonzo region. No harm was done. Above Gorizia one of our aviators brought down an enemy aeroplane after a short fight."

German. *Berlin, July 4th.*

"Nine enemy airmen were shot down without our suffering any losses, 5 during air fights and 4 by anti-aircraft fire. Six of these machines are in our hands."

Berlin, July 6th.

"To the south-west of Cambrai an enemy aviator this morning attacked a stationary hospital train from a low altitude by dropping bombs on it. Six wounded were killed."

Berlin, July 7th.

"South-west of Valenciennes we captured a French aeroplane. Near Péronne and south-west of Vouzières in the course of air fights enemy aeroplanes were compelled to land.

"German air losses in June: In air battles, 2 aeroplanes; shot down from the earth, 1; missing, 4; total 7.

"The French and English lost: In air battles, 23; shot down from the earth, 10; involuntary landings within our lines, 3; landings with the purpose of dropping spies, 1; total, 37 aeroplanes, 22 of which are in our possession."

Berlin, July 8th.

"Lieutenant Mulzer shot down near Miraumont a British superbattle plane. His Majesty the Emperor has bestowed upon this flight officer the Order "Pour le Mérite" in recognition of his accomplishments. An enemy aeroplane was brought down by anti-aircraft fire south-east of Arras. Another, which after an aerial battle south-west of Arras came down on the other side of the enemy lines, was destroyed by artillery fire.

"Near Molodetchno bombs were freely dropped on troops who were awaiting transport. On July 7th a Russian aeroplane, east of Borovno (on the Stokhod), was shot down in aerial battle."

Berlin, July 10th.

"Aerial activity on both sides was very lively. Our aviators shot down five enemy aeroplanes—one near Nieuport, two near Cambrai, two near Bapaume—and two captive balloons, one on the Somme and the other on the Meuse. Senior-Lieutenants Walz and Gerliet have put out of action their fourth, Lieutenant Leffer his fifth, Lieutenant Parschau his eighth opponent. The Emperor has bestowed upon the last-named the Order of Merit.

"German aeroplanes successfully attacked enemy dug-outs east of the Stokhcd."

Austrian. *Vienna, July 9th.*

"North-west of Dubno our airmen dropped bombs on a group of farms occupied by the Staff of a Russian Army Corps. The enemy immediately hoisted the Geneva flag on the threatened houses."

Turkish. *Constantinople, July 8th.*

"A French aeroplane mother-ship appeared before Haifa. Two seaplanes went up, one of which fell into the sea. The pilot and observer were rescued by the other seaplane. We brought the fallen seaplane, which was undamaged, to the coast, and found in it bombs, a machine-gun and munitions."

Constantinople, July 9th.

"Last Friday a British aeroplane parent ship and a French torpedo-boat arrived off Beirut. An aeroplone ascended from the ship and dropped bombs in the vicinity of the port, wounding three civilians."

Bulgarian. *Sofia, July 4th.*

"An enemy aeroplane appeared for a short time over Sofia at 8 o'clock yesterday morning, and dropped eight bombs on various parts of the town without doing any damage. As soon as it was fired at by anti-aircraft guns it fled."

From Other Sources.

Some idea of the part played by the Royal Flying Corps in the great advance is furnished in the accompanying *résumé* from Reuter's special correspondent at the British Headquarters:—

"When the history of the Battle of the Somme comes to be written in its true perspective, I think it will be found that one of the most brilliant facets in this whole lustrous chapter of our military story is the share which our airmen bore in the fighting, and the influence they exercised upon the course of it.

"There is no need to wait upon history, however, to pay a fitting tribute to the Royal Flying Corps. Never at any time has the mastery of the air been so completely in the hands of our men as it is to-day. What was achieved by British aviators on July 1st and in the subsequent fighting has been no mere spontaneous result, but rather the culmination of weeks of arduous devotion and gallantry. How far this is true may be best illustrated by the circumstance that not a single German aeroplane crossed our lines during the opening attack between Gommecourt and the Somme, nor is it at all clear that any enemy kite balloons were in the air during that eventful morning, although I counted eight of our own from the Albert Ridge, where I viewed the bombardment.

"The truth is that the destruction of nine German 'sausages'—six in one coup—within the past few weeks has had a demoralising effect upon the Boche airmen. Prisoners admit this and go further, stating that their gunners are considerably handicapped by the mischief we have wrought with their aerial reconnaissance, and that so venturesome have our 'plane squadrons' become that their men in the trenches often get the 'jumps' at night and blaze away with machine-guns at machines which are 'asleep' in their aerodromes miles away.

"It is unquestionably due to the magnificent work of our airmen, which so largely neutralised the enterprise of the enemy aviators, that the Germans remained in doubt, until the attack actually came, as to where the present offensive would really develop. By sheer daring and perseverance our fliers rendered it so difficult for the hostile machines to get a view of the ground behind our lines that they were unable to get any correct intelligence of our concentrations and gun positions. They were literally harassed night and day. It was British aeroplanes that brought down the enemy kite-balloons, swooping to within 150 ft. of them with a cool disregard for the showers of 'Archies' which they drew around them, and then banking clear of the exploding hulk when the missiles had found their mark.

"Small wonder that the German observers hesitate to court a similar fate at the hands of such intrepid foes. And here I may say that the risks which our Flying Corps have had to face throughout the present offensive have been greatly accentuated by the bad weather conditions, necessitating flying at very low altitudes well within machine-gun range from the ground.

"*A propos*, I see that the German wireless issued last night claims that only seven Boche machines have been brought down during the month of June. I put the question as to how far this tallied with our information to one well-qualified to give an accurate answer. After referring to certain records, he totalled the number at twenty-one (most of them certain crashes, and all of them he described as 'sitters') to the credit of the British airmen alone, without reference to what the French—who are bracketed in the modest German claim—have accounted for.

"So completely have the Royal Flying Corps now established domination of the air over the length of the front that our machines virtually are never molested now during their reconnaissance flights save by anti-aircraft guns. The one-time redoubtable Fokker nowadays keeps well within her own boundaries, and in the last recorded fight with this type, when a squadron of British aircraft were bombing an important station to keep the Germans occupied in these parts while our offensive was beginning southward, no less than twenty of them came buzzing around our machines, and the only result was that two of them bit the dust violently, while all ours returned. This fine incident may well stand as typical of the dominance which the British have attained.

"But let it not be supposed that the aviator has nothing more to do than jump into his seat, take-off, and scurry away in quest of fresh glory, in order to maintain his reputation. There is no branch of the British Army which works harder. For the past week the mechanics of the Royal Flying Corps have been kept busy every livelong night, not because the aeroplanes have received any abnormal degree of damage, but in order to keep things at the concert pitch of proficiency. As a result I honestly believe that our air squadrons are actually stronger to-day than they were before the beginning of the offensive, which is tantamount to saying that they are stronger than ever they were before.

"Not only are the airmen the 'eyes' of the gunners, but of late they have co-operated with the infantry so successfully and to such a degree that the co-ordination between the two is rapidly developing into a regular thing. Indeed, it has become quite a matter of course with more than one battalion to look out for its own particular aeroplane. But if the aircraft can be invaluable to infantry—as manifestly it can—it can also prove a deadly visitor. A day or two ago, as a battalion of the Prussian Guards were marching up to reinforce the hard-pressed enemy, one of our 'planes dropped to within 300 ft., and the observer, depressing his gun, emptied several drums of ammunition into the close ranks, enfilading the whole length of the column with telling effect before the crescendo of rifle fire caused him to sheer off. An officer of this same regiment who was subsequently captured said that the combination of this fierce fusillade and the barrage from our guns behind inflicted a loss of at least 50 per cent. of the strength of the battalion before it reached the shelter of its destination.

"The growing practice of employing aeroplanes in squadrons instead of singly has caused the adoption of a system of tactical evolutions not dissimilar to those followed in the Royal Navy. For example, in cruising, the machines are spread out in "V" formation. For bombing purposes they form into line-ahead, and as the British machines have dropped more than 20 tons of explosives upon sundry selected spots of the German positions of late, it stands that they are getting pretty proficient in the line-ahead manœuvre."

The *Morning Post* correspondent, writing on July 8th, says:—

"I have in various recent despatches commented on the comparative inactivity of the air service of the enemy in contrast with the extraordinary energy and valour of our own flying-men. The Germans are seeking to cover up their deficiencies in the air by circulating officially deliberate inventions intended to minimise their own losses and grossly exaggerate ours. They claim that throughout the entire month of June they lost only seven machines at the hands of the French and ourselves. I do not know what the record of the French airmen may be, but it has been very satisfactory. So far as we are concerned, we claim to have brought down 21 German machines during last month. Our airmen are most careful in their observations, and it may be accepted without question that this figure 21 represents the number of 'sitters' or machines that we know have been brought to earth. One of the remarkable feats in yesterday's operations was accomplished by a British aviator, who swooped down close to the Prussian Guards when they were in sore straits and peppered them with his machine-gun.

"It is now known that on the first day of our 'push' thirty-five combats took place in the air, that five hostile machines were brought down on the enemy's side of the line, and that at least five others, of which two were seen to be damaged, were driven down. One of our officers attacked no fewer than four of these machines single-handed, broke up their formation, and scattered them in all directions. The first machine he tackled was hit between the pilot and the observer, and returned to its aerodrome. The second was hit and managed to land in its own lines under control. When attacking the third, the officer was wounded in the leg, but gallantly continued firing until he got within ten yards of his enemy. He then saw that the hostile observer was firing wildly into the air, and evidently had been wounded. Despite his own wound, the British officer chased yet another hostile machine and fired his remaining drum at it, but had to break off the fight for lack of ammunition. On the day following there were eleven combats in the air, and four enemy machines were brought to earth. On Monday last eleven air fights resulted in the shooting down of a Fokker, which crashed to the ground, and two biplanes were destroyed. These incidents in the air are exclusive of successful attacks on German kite balloons and the dropping of bombs on railway stations in the possession of the enemy. In addition, our airmen have developed an extraordinary aptitude in obtaining photographs and bringing back valuable information on the subject of enemy positions."

The *Times* correspondent, writing on July 9th, says:—

"In the unusually clear air, one of the most beautiful sights which I have ever seen was a fleet of 22 of our battleplanes manœuvring over the enemy's lines, the squadrons circling, crossing, and interweaving at various altitudes. What their mission was I do not know, but besides the great beauty of the spectacle in itself, it would be difficult to conceive anything which could give a more thrilling impression of our mastery, not only of the air, but of the enemy's air service."

Mr. G. Ward Price, writing to the *Times* from Salonica, on July 3rd, says:—

"Another brilliant air raid was made this morning by a French aeroplane, which bombed Sofia for the second time since the Allies came to Macedonia. The pilot was a Frenchman who is perhaps better known at Hendon than even in his own country. He started at 4.30 a.m., and did the return flight of over 300 miles in 5 hrs. 25 mins. It took 2¼ hrs. to reach Sofia from Salonica, and from a height of only just over 6,000 ft. 10 bombs were dropped on military establishments in the Bulgarian capital. It was evident that great alarm was caused by the reports of the bombs, for the two airmen could see a whole line of trams stop dead. Anti-aircraft batteries in the town shelled the raiding aeroplane without hitting it, and on the return journey the batteries on the hills north of Demir Hissar had evidently been warned to look out for it, for a violent fire was opened as soon as the Frenchman got within range. No harm was done."

A semi-official statement issued in Paris on July 4th says:—

"Finally, the part played in the battle by the French and British air services is considerable. Since July 1st no enemy airmen has been able to fly over our lines, and as aircraft of to-day are the eyes of artillery, it can be said that we have blinded the enemy, thus clearly disabling him for purposes of riposte.

"According to the reports of our airmen, there appear to be only two or three more successive systems of defence to force, before battle in open country becomes possible."

Mr. W. Beech Thomas, in his despatch to the *Daily Mail*, dated July 4th, says:—

"But things are quiet on the whole. The enemy is suffering from several things. The muddle of the retreat is one. Another is the want of targets, since his aeroplanes have been driven back and his kite balloons destroyed from the air. He is for the moment blind and not a little out of breath."

The *Times* special correspondent at the British Headquarters, writing on July 6th, says:—

"One must again recur to the extraordinary superiority of our Air Service over that of the enemy. There is not a man in the British Army who has not an almost unlimited admiration for our airmen, and throughout the operations they have been a delight to watch. Their value in observation has been immense. As minor instances, it may be told that in one case an airman signalled the whereabouts of a convoy of nine enemy lorries on a road quite invisible except from the air. One of our heavy batteries opened fire on it and destroyed three of the lorries, and the rest escaped by bolting.

"Another airman a day or two ago was flying near Flers, four miles or so in German territory beyond our line at Contalmaison, when he saw infantry marching on a road, came down and played a machine-gun on them, getting home unscathed. The story of the airmen on this front during the last two weeks would furnish Mr. Kipling with material even more full of romance and reckless daring than the story of the submarines."

The *Times* correspondent at Amsterdam, in a message on July 6th, says that a captive balloon floats above Ostend.

The *Daily Mail* correspondent at Amsterdam, writing on July 5th, says:—

"The Germans appear to be transferring a huge air force to the west. Six or seven Zeppelins went west through Belgium on Monday, and since then aeroplanes have been moved both by rail and by flight."

According to the *Politiken*, a very large Zeppelin passed over the Skagerrak on July 5th. Observers were enabled to have a good view of the airship, which, when she had arrived over the extreme end of Skaw, returned and proceeded in a southerly direction. From Christianssand, Norway, it is reported that during the previous few days Zeppelins have been sighted off Christianssand and off Lillesand, making reconnoitring trips.

Mr. G. Ward Price, writing from Salonica on July 8th, says:—

"The daily activity of the artillery on the frontier was diversified to-day by an attempted German aeroplane attack on the French positions south of Doiran. One of the enemy machines which came under the fire of the French anti-aircraft batteries was brought down, and fell in flames near the lake."

Mr. Stanley Washburn, the *Times* special correspondent with the Russian Forces, writing from Lutsk on July 5th, says:—

"The Germans are increasingly dropping bombs from their aeroplanes upon all the important towns in the rear of our line, with a daily toll of civilian dead and wounded, but with practically no result in any other quarter."

The *Morning Post* correspondent at Salonica, writing on July 9th, says:—

"French aviators were again active to-day. They dropped several bombs on the military establishments at Monastir and also on Fort Rupel and the Bulgarian camps at Petritch. According to the local Greek journal, German aeroplanes yesterday dropped fifteen bombs at Sorovitch, killing some Greek soldiers and wounding other soldiers and civilians."

AIRCRAFT IN THE NAVAL BATTLE.

IN the despatches from Sir John Jellicoe regarding the Battle of Jutland, fought on May 31st and June 1st, there are the following references to aircraft work and the part played by the seaplane ship.

In Sir David Beatty's report of the preliminary stages he says:—

"From a report from 'Galatea' at 2.25 p.m. it was evident that the enemy force was considerable, and not merely an isolated unit of light cruisers, so at 2.45 p.m. I ordered 'Engadine' (Lieutenant-Commander C. G. Robinson) to send up a seaplane and scout to N.N.E. This order was carried out very quickly, and by 3.8 p.m. a seaplane, with Flight-Lieutenant F. J. Rutland, R.N., as pilot, and Assistant Paymaster G. S. Trewin, R.N., as observer, was well under way; her first reports of the enemy were received in 'Engadine' about 3.30 p.m. Owing to clouds it was necessary to fly very low, and in order to identify four enemy light cruisers the seaplane had to fly at a height of 900 ft. within 3,000 yards of them, the light cruisers opening fire on her with every gun that would bear. This in no way interfered with the clarity of their reports, and both Flight-Lieutenant Rutland and Assistant Paymaster Trewin are to be congratulated on their achievement, which indicates that seaplanes under such circumstances are of distinct value.

"At 5.5 p.m. 'Onslow' (Lieutenant-Commander John C. Tovey) and 'Moresby' (Lieutenant Commander Roger V. Alison), who had been detached to assist 'Engadine' with the seaplane, rejoined the battle-cruiser squadrons and took station on the starboard (engaged) bow of 'Lion' (Captain Alfred E. M. Chatfield, C.V.O.).

"He (the enemy) was gradually hauling to the eastward, receiving severe punishment at the head of his line, and probably acting on information received from his light cruisers, which had sighted and were engaged with the Third Battle-Cruiser Squadron. Possibly Zeppelins were present also."

Dealing with the events on the morning of June 1st, Sir John Jellicoe says:—

"The enemy, however, made no sign, and I was reluctantly compelled to the conclusion that the High Sea Fleet had returned into port. Subsequent events proved this assumption to have been correct. Our position must have been known to the enemy, as at 4 a.m. the Fleet engaged a Zeppelin for about five minutes, during which time she had ample opportunity to note and subsequently report the position and course of the British Fleet.

"A cruiser squadron was detached to search for 'Warrior,' which vessel had been abandoned whilst in tow of 'Engadine' on her way to the base owing to bad weather setting in and the vessel becoming unseaworthy, but no trace of her was discovered, and a further subsequent search by a light cruiser squadron having failed to locate her, it is evident that she foundered."

"Sir David Beatty reports in regard to the 'Engadine' as follows:—

"'The work of "Engadine" appears to have been most praiseworthy throughout, and of great value. Lieutenant-Commander C. G. Robinson deserves great credit for the skilful and seamanlike manner in which he handled his ship. He actually towed "Warrior" for 75 miles between 8.40 p.m., May 31st, and 7.15 a.m., June 1st, and was instrumental in saving the lives of her ship's company.'

"I fully endorse his remarks."

IMMELMANN'S LAST FIGHT.

THE following account of the aerial combat, which resulted in the shooting down of Lieut. Immelmann, has been written by the *Times* correspondent at the British Headquarters :—

"Before he left for England I had a talk with the pilot of the machine which vanquished Immelmann, and also with the observer, the man who did the actual shooting. It is one of the absurd chances of war that the great Immelmann (I think we can afford to call him that) should have been brought down by a man who had never been in an aeroplane before last February.

"The pilot (who must be called, as he was called in the official notice, merely 'Lieut. McC.') was, when I saw him, in hospital, and he is now in hospital in England. His injury, however, was not received in the historic fight, but in another encounter a week later, when he succeeded in getting, with the same observer, his second victim. The bullet, one of the latest armour-piercing bullets from the machine-gun in the German aeroplane, had entered 'McC.'s' shoulder, passing down through the muscles of his arm, and remained lodged in the forearm. It was by his bedside as he lay. His comrades of the Flying Corps rejoice, of course, that he should have put an end to the career of the famous enemy airman ; but, from the professional point of view, it was a much finer feat when, with his right arm ripped as it was, in spite of pain and dizziness and loss of blood, with petrol tank shot through, he brought his machine and the observer safely and beautifully to earth in its home aerodrome.

"These amazing fellows are so confident of their superiority in the air to-day that they know that it might have fallen to any one of them to bring down Immelmann. But to do what 'McC.' did in the later encounter when he got his machine so cleanly to earth and then collapsed as it landed—that was a performance of which any man could be proud.

"He looked, as he is, very young ; all the younger, perhaps, because 'McC.' is extremely fair and was additionally pale after his injury and some three days in hospital. He seemed to think that having got his enemy in that particular fight was rather a matter of course, and it was just an extraordinary piece of luck that enemy was Immelmann.

"He went up on the fateful morning for his usual daily patrol in his battleplane with his usual observer, whom, following also the official announcement, we must merely speak of as 'Non-Commissioned Officer W.' They saw Lieutenant Savage patrolling his adjoining beat, and also they saw far overhead three Fokkers. By this time 'McC.' was some 8,000 ft. up. The Fokkers, after their custom, had been waiting behind their lines at some 13,000 ft. Just as 'McC.' saw them one of the three dived and went down to earth ; while the other two dropped straight for Lieutenant Savage. 'McC.' and 'W.' both supposed that the third machine was only going down to get below and join in the fight from another angle. But 'McC.'s' business was to go for what he saw ; and that was the two Fokkers, which were dropping, like hawks after their prey, on his comrade's machine.

"Lieutenant Savage also dived to avoid the first rush of the two attackers, so that the actual fight took place at about 5,500 ft. ; and down at one sheer drop for 2,500 ft. went 'McC.' to join in. It is a dizzying thing even to think of, the two birds of prey plunging through the almost illimitable space on the quarry below, and 'McC.' sweeping after them to his comrade's help. As he drew near he saw that he was already too late to bring help ; only retribution remained. As he dropped, he saw Lieut. Savage's machine get out of control and then go plumb down to earth. Evidently the pilot himself had been shot from the foremost of the two Fokkers which had dived straight down for the tail of the British machine. 'McC.' followed no less straight. Before Immelmann had begun to steady himself from his victorious plunge 'McC." was on him. He took no chance of firing from a safe distance, but went straight in, confident in his observer's nerve, and it was not until he was almost touching the other machine that 'W.' fired. At the very first round the enemy was hit. The machine seemed suddenly to bank, turned clean over on its right side, and then went down like a stone.

"Meanwhile the second Fokker had swung round, and in its turn was coming for 'McC.' The latter swerved, and circled to get inside the enemy; but no shot was exchanged. 'McC.' did not know who was in the machine which had fallen. Doubtless the occupant of the other Fokker did ; and, knowing that Immelmann was gone, either had not the heart or the nerve to continue the fight, so he dropped down after his lost comrade.

"It was all a very gallant and very thrilling affair. In the fight of the following week, when 'McC.,' again with 'W.,' was one of five British battleplanes which met five Fokkers and brought down two of them, while all our machines came safely back, except for 'McC.'s' injury to his arm, the thing was on an even more heroic scale. But it has not the glamour of the fight which was Immelmann's last.

"At the squadron aerodrome, not far from where 'McC.' was in hospital, I saw the battle-scarred machine in which he made his flights. It is not the veteran of the squadron ; for that is another of the same type which has over 200 patches on its planes where enemy bullets have gone through. 'McC.'s' machine, however, is bad enough ; and, besides all the peppering of the planes, you can see plainly the hole where the bullet went through which caught him in the shoulder, while there are other holes in the body of the machine which narrowly missed being even more serious.

"When I was there two large wreaths of flowers lay on the ground stitched up in canvas. One was for Lieut. Savage and the other for Immelmann. That night it was the intention that they should be dropped by aeroplane into the enemy's aerodrome."

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Overseas Delegates at Farnborough.

THE Delegates from the Oversea Dominion Parliaments, who are now paying a visit of war inspection to the country as the guests of the Empire Parliamentary Association, were at Farnborough on Saturday. They witnessed several flights by R.F.C. officers, and subsequently were conducted round the Royal Aircraft Factory by Col. Mervyn O'Gorman, C.B.

The War Inventions Board.

IT is announced that Vice-Admiral Sir Richard H. Peirse, K.C.B., M.V.O., has been appointed Naval Member of the Central Committee of the Board of Invention and Research.

R.F.C. Wireless Workers at Play.

AT the A.A.A. military sports at Stamford Bridge on Saturday the R.F.C. Wireless Section team finished second to the Army Service Corps (M.T.) Grove Park team in the one mile relay race. The winning team was the Australian sprinter, C. J. Mears, the world's champion, Private W. R. Applegarth, P. Hodge, and S. Wood, while the R.F.C. team was P. E. Mann, F. Gaby, Saul, and the old Army champion, Sergeant F. Mawby.

The Edward Busk Studentship.

APPLICATIONS will shortly be invited for the above Aeronautical Research Studentship. The remuneration will be at a rate not exceeding £150 per annum for a period of one year, with an extension in special circumstances to two years. Further particulars can be had from the Aeronautical Society, 11, Adam Street, Adelphi, W.C.

A Thank Offering.

A PLAQUE was unveiled at St. Mary's Church, Ramsgate, on Sunday, as a memorial of "the church's preservation on the night of the first Zeppelin raid, when bombs from hostile aircraft fell close to the building."

Mr. Pemberton Billing Joins Up.

ON Friday of last week Mr. Pemberton Billing, M.P., in response to an official notice, attended at Stratford, and was duly enrolled for "garrison duty at home." He received the customary 2*s*. 7*d*.; but as he was given indefinite leave we venture to think—and hope—that this will be the close of this incident in the M.P.'s life.

Fatal Accidents.

WHILE flying on the East Coast of Scotland about 9 p.m. on July 5th, an aeroplane fell in a field in a lonely district. The pilot, named Hamel, was instantly killed, and the passenger, named Berry, severely injured.

Flight Lieut. Wallis was also killed in the east of Scotland. It is stated that he was flying comparatively low across a railway when a train dashed by. The aeroplane dived to the ground, and the pilot was instantly killed.

A double fatality occurred near Whitstable on July 8th. After circling over the town, the machine in coming down suddenly nose-dived and fell to the ground. The pilot was killed, while the passenger died on the way to the hospital.

Gallant Rescues by Pilots.

TIMELY aid by Messrs. Sidney C. Lambert and Eric G. Adams, two pilots, led to the rescue of two girls, who were thrown out of a canoe which capsized on the Thames near Reading. The pilots dived in in full uniform. Unfortunately a third girl was drowned.

"Airy Fairy Lilian," or the Pull of the Plane.

AMONG other items discovered in the room of Lilian Hargreaves—with an alias—charged at Blackpool with stealing £134 from her employer, a boarding-house keeper, were receipts for three trips in aeroplanes at two guineas a time.

Zeppelins and Dutch Ships.

ACCORDING to the *Handelsblad*, the Dutch schooner "Weldaad," of Groningen, which arrived at Ymuiden from Karlskrona on Sunday, reports that she was attacked by a Zeppelin six miles off the Horn Reefs. The bomb which was dropped exploded in the sea.

The opening of the Whitehead Aircraft Co.'s new works by Sir Charles Wakefield. On the Lord Mayor's left, seated, is Mr. J. A. Whitehead, the founder of the Company.

FURTHER EXTENSION OF THE WHITEHEAD AIRCRAFT WORKS.

THE original small factory at Richmond with which Mr. J. A. Whitehead entered the ranks of aircraft manufacturers, about twelve months back, having proved itself completely inadequate for the remarkable business which has grown up so rapidly under his exceptional organisation, it was found necessary to supplement this by new premises for the Whitehead Aircraft Co., Ltd. On Monday last this important extension, which has been erected in record time, was inaugurated by the Lord Mayor of London, Sir Charles Wakefield.

It was a most successful ceremony, a large number of distinguished guests being present in addition to some 600 workers. The Lord Mayor, who was received by the Mayor of Richmond, was presented with a beautifully made silver model biplane. Mr. J. Ward, the popular and capable works' manager, was also presented with a souvenir in the form of a gold watch subscribed for by the workers of the factory. Hanging up inside the building opposite the entrance was a banner bearing the firm's motto:—"There is no fun like work." Altogether a very happy gathering, from which the Whitehead employees are likely to get inspiration for efforts to further push along the undertaking with which each and every one is proud to be associated.

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H. M. HOBSON, LTD., AND THE WAR.

THE war has wrought many changes in our commercial life, and in none so much as in the aviation industry. Firms whose business before the war was quite unconnected with aviation are now engaged in one way or another with the construction of aircraft, whilst those firms already in the industry, having previously only just managed to keep going, found themselves "full up to overflowing" with work, necessitating extensive additions to their factories or plants. Such was the case, for instance, with the House of Hobson. Prior to, and in the early stages of the war, business with the famous Claudel-Hobson carburettors and Hobson sparking plugs for aero engines was brisk, but by no means beyond the scope of existing resources of production and supply. Eventually, however, an ever-growing demand for these articles, as well as for a special type of carburettor for the Government, soon brought about the position of being unable to keep pace with the requirements of the day. Hence the remarkable metamorphosis at 29, Vauxhall Bridge Road, which, originally a garage and repair works, is now a fully-fledged factory with up-to-date machine shops.

"Here," said Mr. Crump, as he showed us round, "is where we used to wash the cars," but it did not look like it, for machinery now fills up every inch of available space. So also was the state of affairs in the shops where cars once used to be overhauled and repaired, whilst upstairs machinery and benches were to be found everywhere—and yet, unless you had seen these self-same premises in the early days, it would be impossible to tell they were not originally equipped for the business in hand. Such is organisation and adaptability. The work done "down Vauxhall way," by the way, is only supplementary to that carried out at the large Hobson factory at Birmingham—but even this does not satisfy the directors, for we understand that yet another establishment is to be in full swing before long.

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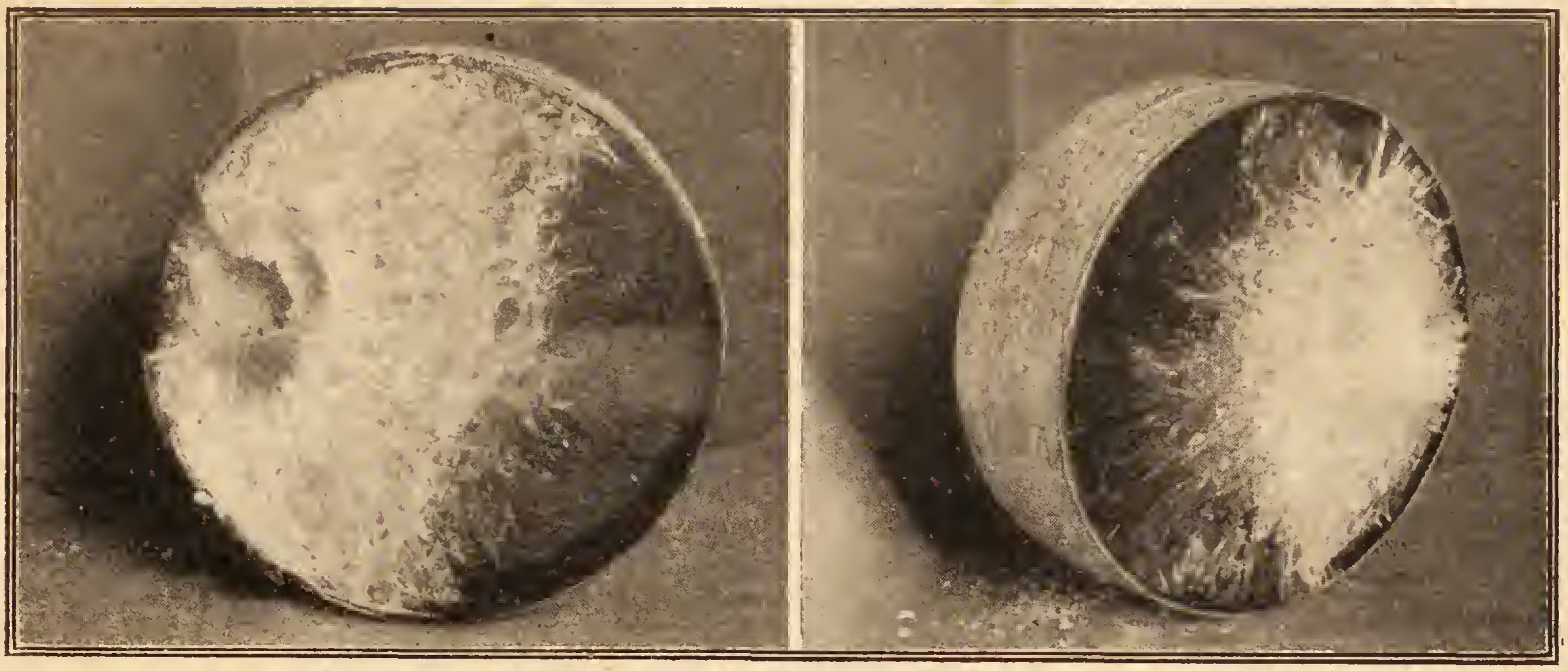
UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park & District (30, RONALDS ROAD, HIGHBURY, N.).

Monthly Report.—During June much good work has been carried out, especially with regard to the construction and flying of model waterplanes. On June 3rd the club met at Highgate Ponds, where waterplanes were flown with varying success by Messrs. A. Richards and F. E. Rayner. The latter, after a few minor adjustments of his floats, managed to make his machine rise off water, and perform short flights, but the former was less fortunate, owing to his machine requiring a few alterations, which could not be carried out on the spot. Mr. E. Coleman, who was flying a freak monoplane fitted with a land chassis, after many excellent flights, had the misfortune to fly over and finally land in the lake, where his machine sunk before it could be rescued; he received 3*s.* 6*d.* compensation from the club insurance for the lost machine. On June 10th the club again met at Highgate Ponds. This time four members had waterplanes, namely, Messrs. A. Richards, F. E. Rayner, H. Mullin, and E. Coleman. All four members put up some very good exhibitions of taxying on the water and flying, but owing to a deluge of rain and hail which fell during the afternoon, it is feared that the members were as wet as their machines. On June 17th the club held a meeting on its home ground for the first time during the month, when much good flying was done by Messrs. A. Richards, F. E. Rayner, E. Coleman, and W. Hardinge. Mr. Eric Coleman was flying a new light-weight 3-ft. mono. of just over 3 ozs. This machine put up many splendid flights, and was lost from sight on two occasions; the latter time, unfortunately, it was not recovered. This is the second machine which this member has lost during the month; he again receives compensation under the club insurance scheme. Several good flights were put up by the secretary, Mr. F. E. Rayner's large monoplane, but no great durations were registered owing to the somewhat heavy wind. Mr. A. Richards was flying most consistently all the afternoon and evening, his machine being a 2ft. 6 in. light-weight monoplane of about 2½ ozs. Mr. W. Hardinge was also flying a machine of this type, but after several good flights this member had the misfortune to break his *fuselage* in a bad landing. June 24th, the club members once more met at Parliament Hill (near Highgate Ponds), but this time with land machines. Several members were present, but owing to the bad weather only two with machines, namely, Mr. A. Richards and Mr. E. Coleman. The former, despite the very gusty winds which prevailed throughout the afternoon, made many fine flights with his small tractor monoplane, most notable of which was one in which the machine rose off ground under her own power, and flew about 300 yards in a wind of about 30 m.p.h. Mr. E. Coleman also gave a display of what could be done in the way of "wind fighting" on a strongly-built machine, and made many good flights during the afternoon.



A remarkable example of the wisdom of having Triplex glass fitted.—An 8-ply Triplex observation panel, from an armoured car, showing the effect of reversed German ammunition at 25 yds. On the left, front view, and on the right, a back view of the Triplex panel.

CORRESPONDENCE.

The Case of the Firm of "Mann and Grimmer."

[1926] Our vicissitudes for several years past are familiar both to your readers and yourself. For the last two years the firm of Mann and Grimmer has been financed by a prominent solicitor of Regent Street. Last year we succeeded in producing "M.1," a twin-propeller battleplane with a speed of 85 miles per hour and a climb of 500 ft. per minute. At the end of March in the present year, despairing of being able to secure any recognition from the Government, our financier withdrew his support. Left to our own resources, we were able to secure a Government contract for a new and improved machine, "M. 2A," designed for a speed of 100 miles per hour, together with a substantial subsidy. Although we had every legal right to execute this contract ourselves, on strictly sentimental grounds we re-approached our previous financier, made him a present of the contract and cheque, and accepted a re-engagement from him as designer and manager respectively on a weekly basis on the *verbal* understanding that should the machine turn out an established success we were to have a substantial share in the business.

Time went on, the new machine was three-fourths designed and constructed, when from no adequate cause at all our past financier attempted to spring an unprovoked quarrel upon us in which he suggested a possible dismissal. We immediately asked him to define our status in the firm, and his reply was instant dismissal. This was followed by the sale of the incompleted machine to "Blériot Aeronautics," the closing of the works, and the dismissal of the entire staff who have worked with us so long. Thus at a single stroke we have been deprived of the fruits of our five years of experiment which commenced in 1911 presumably in order that our one-time financier—a gentleman that we trusted too implicitly to ask for any formal agreement—might reap the greater profit!

With regard to the uncompleted machine now at Brooklands, we have the reluctant duty of disclaiming any responsibility for its safety and performance. No one regrets more than ourselves the scandal of the closing down of an aeroplane works in time of war, the cessation of our long—and we hope we may add valuable—experiments, and the rending apart of our staff, all members of which have been our friends and comrades. The War Office refuses either to intervene or to give us a second contract, but the question is being raised by our friends in both Houses and before the Judicial Committee. The action taken appears to be an attempt to take away our means of livelihood, to deprive the science of the results of our long years of assiduous and dangerous experiment, and to cast—tacitly—aspersions on our characters. We are both plain men, unversed in the devious ways of the law, but we consider that this drastic action of our one-time financier, however valid it may be legally, is not in accord with the principles either of equity or business morals. We wish at the same time to thank our many friends in the industry who have sent messages of sympathy during this last fortnight of trial.

R. F. MANN.
ROBERT P. GRIMMER.
Surbiton, July 7th, 1916. (Late of Mann and Grimmer).

[Taking the case as stated above, there would certainly appear to be scope for an enquiry into the position which has been created. We can hardly conceive that the authorities will endorse without protest what would seem upon the face of it to be a very serious injustice.—ED.]

* * *

IN the R.F.C. they agree that the feminine of airman is heiress.—*Whipped Topics.*

! ! !

(SCENE: *T.B. at anchor. Calm evening.*)
FIRST A.B.: "Listen, Bill; an aeroplane!"
SECOND A.B.: "That ain't a aireoplane. It's the Chief Engineer 'umming!"—*London Opinion.*

* * *

PUBLICATION RECEIVED.

Dynamical Stability of Aeroplanes. Abstract of Thesis. By J. C. Hunsaker. Boston, Mass.: Massachusetts Institute of Technology.

* * *

IMPORTS AND EXPORTS, 1915-1916.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; for 1914, see "FLIGHT" for January 15th, 1915; and for 1915, see "FLIGHT" for January 13th, 1916:—

	Imports.		Exports.		Re-Exportation.	
	1915.	1916.	1915.	1916.	1915.	1916.
	£	£	£	£	£	£
January ...	20,382	1,509	435	6,399	13,706	—
February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	50,287	2,400	—
	28,878	21,696	48,037	154,024	48,544	4,090

* * *

NOTICE.—Owing to pressure upon our Advertisement columns, we have been compelled to hold over several advertisements.

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THE PUBLISHERS.

EDITORIAL COMMENT.

The N.P.L. Report for the Year 1915-16.

NOT only has the war greatly affected the work done at that great asset of the Empire, the National Physical Laboratory at Teddington, but a very great amount of the work carried out has been, as we have in the past had occasion to point out, of such a nature that publication of the results obtained would be unwise at the present moment. This applies to aeronautics as well as, if not more than, to other branches of research. It must not, however, be concluded that the absence of published detail reports indicates that there is a lessening in the amount of research work done. On the contrary, the last two years have seen a very marked increase in the number of experiments, so much so, in fact, that from the very much curtailed annual volume just issued for 1915-16 we find it has been found necessary to construct two new air channels, one of 4 ft. and one of 7 ft. diameter. These are now almost completed and new buildings have been provided for the accommodation of the greatly increased staff. The equipment of the laboratory now consists of two 7 ft. channels, two 4 ft., and one 3 ft. channel, a whirling arm of 60 ft. diameter for testing propellers, and a small water channel for photographic records of the flow of fluids.

Little may be said of the *results* of the various experiments carried out, but a brief reference to the *nature* of the experiments is permissible. In continuation of earlier experiments a number of different wing sections have been tested with a view to finding one which will give a good speed range while having a reasonably high lift coefficient. The experiments on the effects of biplane spacings have been continued with more modern wing sections than those employed in the earlier tests, a very important question, since the amount, if not the character, of interference between the two wings of a biplane will vary according to the section employed.

The special types of machines evolved in order to meet the requirements of actual war service have rendered a study of the various bodies employed very important, and a series of experiments have been carried out, presumably with a view to determining the resistance and stability of bodies of different types with their complement of guns, &c. Other experiments have been made on the combination of body, tail plane and elevator, fins and rudder, an item of the greatest importance from the point of view of stability, since the shape and proportions of an aeroplane body must necessarily have their effect on the flow of air round the control organs of the machine, and the scientific design of tail planes has in the past been restricted by lack of sufficient data to such rule-of-thumb methods as making the tail about twice the size it would be required to be if working in undisturbed air. Not only will the effectiveness of the tail planes be influenced by the flow of air round the type of body employed, but also by the fact that they are working in the slip stream of the propeller when the engine is running, and in addition the air passing around the control surfaces has been disturbed by the main planes.

The latter brings up the question of mutual interference of the various components of an aeroplane, and this has been dealt with in a series of experiments on models of complete aeroplanes, directed mainly to the investigation of the stability and controllability of aeroplanes in flight. In addition to the experimental investigation into the stability of aeroplanes the mathematical analysis of the disturbed rectilinear motion has been extended. Not only so, but the analysis of the disturbed motion in curvilinear flight, although not yet completed, has been commenced and has given some interesting results.

The study of and experiments on propellers has been continued, the chief innovation to be recorded in this connection being a successful attempt to transfer some of the test work from the whirling arm to the wind channels where the work of investigation is much simpler and considerably more accurate. Among the experiments thus transferred to the wind channel may be mentioned that of determining the interference between the propeller and body of an aeroplane.

Among the special investigations one of the most connected series, and certainly a very important one, which is, as a matter of fact, still in progress, relates to the efficiency of radiators for aeroplanes from the point of view of the relation of resistance to rate of cooling. The urgent necessity of investigation in this direction was pointed out in "FLIGHT" many months ago, and its importance is increasing daily with tendency towards the more general employment of larger, water-cooled engines.

While thus a great deal has been accomplished in the investigation of aeroplanes and all appertaining to them, it must not be thought that the problems relating to lighter-than-air craft have been neglected. Experiments on airship models have been carried out, chiefly with a view to the determination of the effect of the fin area on the restoring couples that follow a displacement. The mathematical analysis of the stability of airships is being proceeded with contemporaneously with the experimental investigations, and follows along the lines adopted in the case of the aeroplane.

From the fact that it is stated that there has been a very marked decrease in the number of models of mercantile ships tested, while at the same time an appreciable increase has been made in the staff engaged on experiments in the Froude tank, it may perhaps be permissible to conclude that much of the work carried out for the Admiralty in the tank has been in the nature of investigations relating to seaplanes and seaplane floats. This work has necessarily been of a very confidential nature, but it may be taken for granted that it has been of the very greatest importance.

In addition to what might be termed the purely aerodynamical portion of the researches, some interesti tests belonging to the mechanical constructional side aircraft work have been carried out. Among the mention may be made of some fatigue tests on timb for aeroplane construction, and on wires subjected vibration. Tests of various metals have also had atte tion, and this subject will, it is hoped, be dealt with mo fully during the coming year. Of more particular inter to those whose flying has to be done over water are t tests which have been carried out with Kapok and oth life-saving floats; the greatest difficulty with Kapok to get a really watertight cover.

From the foregoing very brief *résumé* of the activiti of the Laboratory, it must not be taken that the enti efforts of the staff are directed to aeronautical researc As a fact, this side of scientific investigation occupi but a small portion of the time of the Teddington ins tution, to the director of which the country owes a ve great debt of obligation. A satisfactory feature of t "carrying on" of the Laboratory in these days of stre is to be noted in the number of voluntary assistants wh have given their services and the co-operation of women who have filled positions usually allotted men.

* * *

The New Song of Hate of the Zepp.

Almost as if by way of a commentary the concluding remarks of our leader t week before last on Aircraft Insurance, t very venomous "appeal" for funds by t German Air League came somewh appropriately to point our suggestion of possible Zeppe aggression presently, in gratification of the Huns' no intensified hatred of everything British, and especial of their powerlessness to overcome our advantageo insular position.

What sort of "public" is it that is gulled and bled its subscriptions by such balderdash as the following:—

> "When the column of fire springs upwards to the night sky fro the burning streets of London, the metropolis of the world, th new knowledge gleams from the flames. When the squadrons bold airmen carry across the North Sea mischief to England, th the new song of the new war resounds from their heroic deeds."

Yet it is this sort of stuff that is issued above t signatures of such men as Dr. Paasche, Vice-Preside of the Reichstag, and Herr E. Humperdinck, the co poser. Nothing could better demonstrate the straits which the Germanic race have been reduced by th mistaken war than an outbreak of this character. suggests, nevertheless, the direction in which these ho minds are running, and our countering organisati should be on the alert to see that the marauders do n snatch a chance of obtaining partial success, owing any momentary want of watchfulness upon our pa The recently reported activity of the Zepps. on the Danis coast and elsewhere carries little significance in th connection. These aircraft are more concerned anxiously watching for possible moves on our part, our fleet and otherwise, to have much time to spare present for hazardous trips to this country. The tim *will* come, however, when we may once more be deem worthy of attention, and it is that contingency again which we have to guard. Although there are already matter of 1,884,000 insurance policies taken out und the National Aircraft Scheme, there are still plenty w within the zone range of these raiders. We have ofte heard that to be insured is a long way towards avoidin anything happening. So to the uninsured we woul suggest that they should "think it over."

The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of July 12th :—

Temporary Sub-Lieut. (R.N.V.R.) N. W. Frames, entered as Probationary Flight Sub-Lieutenant (temporary) seniority of July 12th, and appointed to "President," additional.

Probationary Flight Sub-Lieutenant G. N. Lindeman (temporary commission as Sub-Lieutenant (R.N.V.R.), re-issued with original seniority of April 5th, 1915, and appointed to "President," for R.N.A.S.

The following appeared among the Admiralty announcements of the 13th inst. :—

C. Hanson-Abbott, entered as Probationary Flight Sub-Lieut. (temporary), seniority July 2nd, and appointed to "President," for R.N.A.S. The undermentioned have been entered as Probationary Flight Sub-Lieutenants (temporary), seniority of July 16th, and appointed to "President," additional to R.N.A.S. ; C. R. Rischbieth, F. S. G. Lewis, P. G. Williams, A. B. Holcroft, H. W. Kendall, E. B. Drake, H. W. T. Chalcraft, A L. Taylor, L. V. Kahn, E. J. K. Buckley, F. I. Jacks, J. C. Arnold, F. J. Hosking, H. E. Winter, O. B. Ellis, L. E. Pulford, and Lord Ossulton.

The following appeared among the Admiralty announcements of July 15th :—

The following temporary commissions (R.N.V.R.) have been granted ; Lieut. S. R. Mullard. Sub-Lieuts. J. F. Burgess and L. N. Robinson, all seniority July 14th, and all appointed to "President," additional for R.N.A.S.

The following appeared among the Admiralty announcements of July 17th :—

Mr. G. F. Creaghan, entered as Probationary Flight Sub-Lieutenant (temporary), seniority July 23rd, and appointed to "President," additional for R.N.A.S.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of July 11th :—

Attached to Headquarter Units.

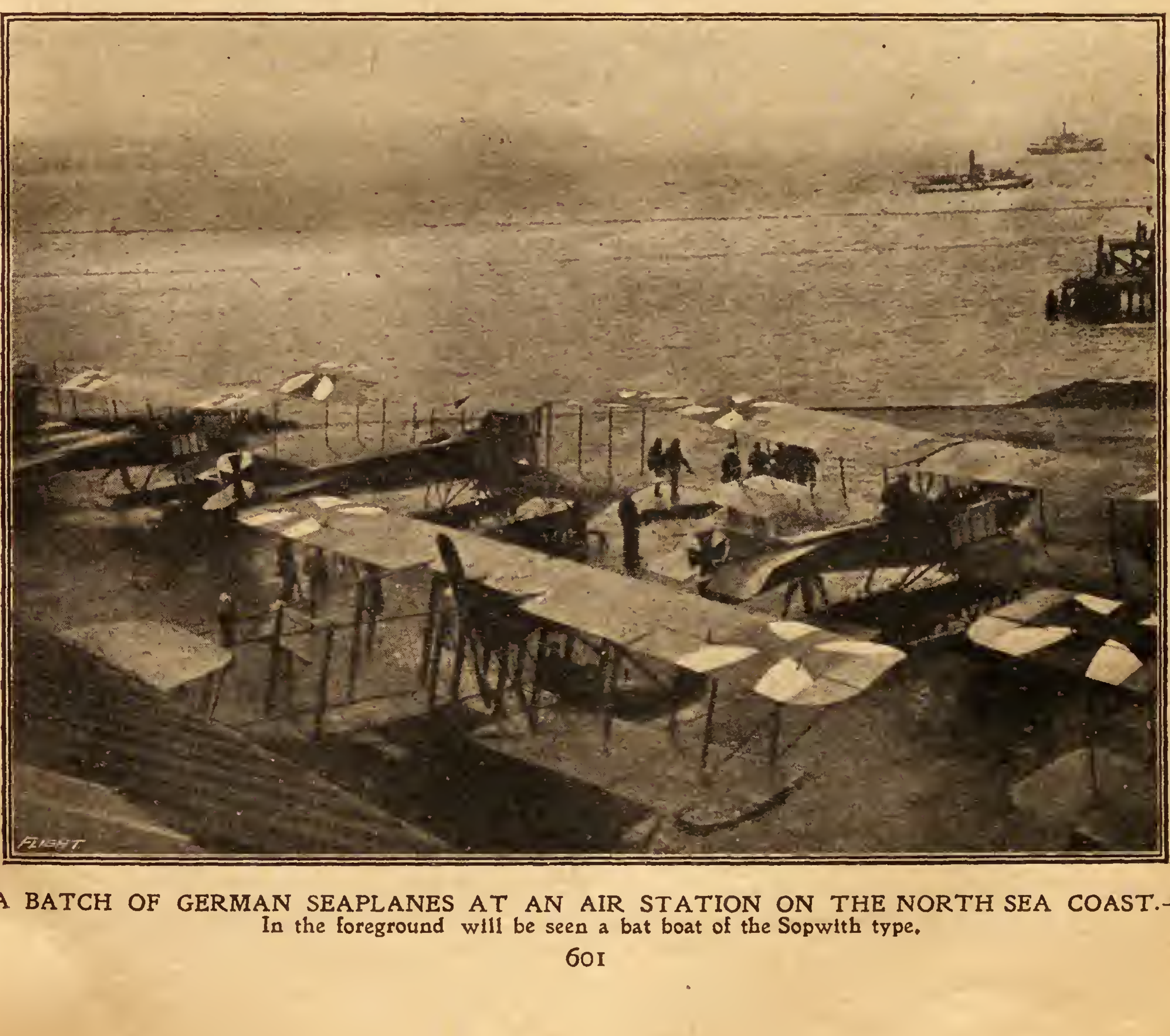
Brigade-Commander.—Bt. Lieut.-Col. W. G. H. Salmond, R.A., from a Wing Comdr. R.F.C., and to be Temporary Brig.-General whilst so employed ; July 1st, 1916.

Brigade-Major.—Major D. L. Brereton, Durh. L.I. ; June 30th, 1916.

Establishments.

Flight-Commanders (*from Balloon Officers*).—Temporary Capts. J. O. Davis and Hon. A. S. Byng, General List ; May 17th, 1916. Capt. G. Disney, Essex R. ; June 1st, 1916. Capt. L. S. B. Hull, R. W. Surr. R. (T.F.) ; June 3rd, 1916. Capt. F. X. Russell, R. Muns. Fus. ; June 12th, 1916. Temporary Lieut. A. C. B. Geddes, General List, and to be Temporary Captain whilst so employed ; June 26th, 1916. Bt. Major A. J. Ross, R.E., from a Flying Officer ; June 22nd, 1916. Lieut. H. O'N. de H. Segrave, R. War. R., from a Flying Officer and to be Temporary Capt. whilst so employed ; May 29th, 1916. Lieut. R. G. H. Murray, 9th Gurkha Rif., Indian Army, from a Flying Officer, and to be Temporary Capt. whilst so employed ; June 21st, 1916.

Flying Officers.—Temporary Second Lieut. H. S. Paynter, E. Surr. R., and to be transferred to the General List ; Second Lieut. R. H. Wallace, Montgomeryshire Yeo. (T.F.) ; Second Lieut. E. D. Hicks, 11th (Res) Canadian Inf. Bn. ; Second Lieuts.



A BATCH OF GERMAN SEAPLANES AT AN AIR STATION ON THE NORTH SEA COAST.—In the foreground will be seen a bat boat of the Sopwith type.

C. H. Howell, H. H. Turk, and F. McD. C. Turner, Special Reserve; Second Lieut. (on probation) J. I. Mackay, W. Rid. R. (Special Reserve), and to be seconded; Second Lieuts. B. H. Hunt, T. Macleod, and C. Kerr, Special Reserve; Temporary Second Lieut. O. E. Simmonds, General List; Second Lieut. G. V. Almer, Special Reserve (since deceased); June 17th, 1916. Second Lieut. C. S. Hollinghurst, Special Reserve; June 21st, 1916. Capt. E. D. Drew, R. W. Surr. R., and to be seconded; Capt. G. G. Adeley, R. Ir. Rif., and to be seconded; Lieut. E. D. Dent, R. Dub. Fus. (Special Reserve), and to be seconded; Lieut. H. A. Fordham, North'd Fus., and to be seconded; Second Lieut. (temporary Lieut.) A. E. Davis, Suff. R. (T.F.); Temporary Second Lieut. P. D. Stuart, L'pool R., and to be transferred to the General List; Temporary Second Lieut. C. C. Brill, attd. E. Surr. R., and to be transferred to the General List; Second Lieut. H. C. Lovely, Bedf. R. (Special Reserve), and to be seconded; Second Lieut. A. G. Taylor, Montgomeryshire Yeo. (T.F.); Temporary Second Lieut. P. G. Horswell, R. Lanc. R., and to be transferred to the General List; Second Lieut. F. O. Cave, Rif. Brig., and to be seconded; Second Lieut. L. M. McCoy, Special Reserve; Second Lieut. (on probation) C. D. Kershaw, W. Rid. R. (Special Reserve), and to be seconded; Second Lieuts. R. A. Delhaye and A. H. Vinson, Special Reserve; Second Lieut. H. G. White, E. Kent R., and to be seconded; Second Lieut. H. R. Harker, Special Reserve; Temporary Second Lieut. G. M. Clarke, Leins. R.; June 22nd, 1916; Temporary Second Lieut. J. H. Norton, 7th Res. Regt. of Cav., and to be transferred to the General List; Temporary Second Lieut. B. W. Blayney, North'd Fus., and to be transferred to the General List; June 23rd, 1916.

Balloon Officers.—Second Lieut. J. E. S. P. Bradford, W. Rid. R., and to be seconded; June 22nd, 1916. Second Lieut. (Temporary Capt.) the Hon. E. G. W. T. Knollys, Lond. R. (T.F.); June 26th, 1916.

Assistant Equipment Officer.—Temporary Second Lieut. H. Cumming, Midd'x R., and to be transferred to the General List; June 25th, 1916.

Memoranda.—To be Temporary Second Lieutenants for duty with the R.F.C.; July 8th, 1916: Lce. Corpl. Henry Kirton, from R.E.; Driver Frederick G. Litchfield, from H.A.C. (T.F.); Pte. Coryndon S. Edwards, from Inns of Court O.T.C.; Cadet Charles S. Hall, from Durham Univ., O.T.C.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: W. L. Scandrett, C. H. Howell, F. McD. C. Turner, H. H. Turk, R. A. Delhaye, B. H. Hunt, T. Macleod, C. Kerr, C. M. Denny, L. R. Wright, A. H. Vinson, J. C. Forsyth, H. R. Harker, C. S. Hollinghurst, W. M. Cumming, F. M. Iredale, F. B. Burton, I. N. Dracopoli, G. Purvis Russell-Balfour-Kinnear.

To be Second Lieutenants (on probation): Alfred E. Fincher-Brookes; June 8th, 1916. Francis C. Young; June 17th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 12th:—

Flying Officers.—Lieut. (Temporary Capt.) G. L. Hunting, North'd Fus. (T.F.); May 6th, 1916. Temporary Second Lieut. A. A. N. Pentland, General List; May 27th, 1916. Temporary Second Lieut. H. K. Gibson, North'd Fus., and to be transferred to the General List; May 29th, 1916. Second Lieut. A. Cropper, Wilts R., and to be seconded; May 30th, 1916. Second Lieut. W. A. McCloughry, 9th Australian Light Horse; June 21st, 1916. Temporary Lieut. The Hon. E. F. P. Lubbock, A.S.C., and to be transferred to the General List; June 22nd, 1916. Second Lieut. J. P. Porter, Special Reserve; June 23rd, 1916. June 24th, 1916: Capt. A. J. M. Pemberton, Leins. R., and to be seconded; Temporary Lieut. J. T. Milne, General List, from a Flying Officer (Observer); Lieut. A. G. Henshaw, Canadian General List; Temporary Second Lieut. J. W. Lawlor, A.S.C., and to be transferred to the General List: Temporary Second Lieut. T. W. L. Saunt, R.A., and to be transferred to the General List; Second Lieut. C. Gordon-Davis, N. Staff. R., and to be seconded. June 26th, 1916: Lieut. G. Wadden, R. I. Fus., and to be seconded; Second Lieut. H. C. Davis, R. Berks R., Special Reserve, and to be seconded; Second Lieut. (on probation) H. MacKenzie, R. Lanc. R., Special Reserve, and to be seconded; Second Lieut. J. W. Lockhart, Special Reserve. Second Lieut. C. T. Daily, Special Reserve; June, 1916.

Assistant Equipment Officers.—June 22nd, 1916: Second Lieuts. J. C. Forsyth and F. B. Burton, Special Reserve. Temporary Lieut. G. E. Giles, A.S.C., and to be transferred to the General List; June 29th, 1916.

Memoranda.—Brevet Lieut.-Col. E. M. Maitland, Essex R., to be Temporary Colonel whilst Commandant of a R.N. Air Station; July 13th, 1916.

To be Temporary Second Lieutenants for duty with the R.F.C.; July 8th, 1916: Lance-Corpl. William S. Philcox, from Dulwich Coll. O.T.C.; Pioneer Philip Wake, from R.E.; Pte. John H. Cooper, from Hamps. R., Special Reserve; Pte. Talbot B. Bruce, from Tonbridge Sch. O.T.C.; Pte. Alfred J. Gogarty, from Cam'n Highrs., Special Reserve; Cadet Lieut. Edward O. L. Bell, from Marlborough Coll. O.T.C. From Inns of Court O.T.C.: Ptes. Mervyn J. Sonnenberg, John H. O. Jones, Francis C. Lamb and Bernard Elliott.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: C. T. Lally, J. P. Porter, J. W. Lockhart and H. G. H. MacSwiney.

Thomas Morrison to be Second Lieutenant (on probation); May 21st, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 13th:—

Park-Commanders.—Maj. A. D Carden, R.E., from a Squadron-Commander; May 10th, 1916. Temporary Capt. T. E. St. C. Daniell, General List, from an Equipment Officer and to be Temporary Major whilst so employed; June 7th, 1916.

Flying Officer.—The appointment of Temporary Second Lieut. S. O. Barnsdale, General List, is antedated to May 24th, 1916.

Flying Officer (Observer).—Temporary Second Lieut. W. H. Peirce, R.A., and to be transferred to the General List; June 1st, 1916.

Assistant Equipment Officers.—Second Lieut. C. M. Denny, Special Reserve; April 3rd, 1916. Second Lieut. L. R. Wright, Special Reserve; April 4, 1916. Lieut. (Temporary Capt.) J. B. Bowen, Pembroke Yeo. (T.F.): April 20th, 1916. May 4th, 1916; Temporary Second Lieut. R. J. Everest, General List; Temporary Second Lieut. A. J. O. Spiers, General List; Temporary Second Lieut. J. A. Pritchard, General List; May 14th, 1916. Second Lieut. (Temporary Lieut.) Sir J. W. B. Simeon, Bt., Hamps. R. (T.F.); June 7th, 1916. June 24th, 1916: Second Lieut. W. M. Cumming, Special Reserve; Temporary Second Lieut. A. W. Empson, General List; Second Lieut. F. M. Iredale, Special Reserve; Second Lieut. I. N. Dracopoll, Special Reserve.

Supplementary to Regular Corps.—Thomas Goulbourn to be Second Lieutenant; June 8th, 1916.

The following appeared in the *London Gazette* of July 14th:—

Attached to Headquarter Units.

Staff Captain.—June 7th, 1916; Capt. H. N. Walker, Welsh R., from a Wing-Adjutant, R.F.C., vice Temporary Lieut. N. C. F. Francis, Lond. Brig., R.F.A. (T.F.).

Establishments.

Flight-Commander.—Temporary Lieut. R. H. Peck, from a Flying Officer and to be Temporary Capt. whilst so employed: June 29th, 1916.

Flying Officers.—Temporary Capt. B. T. Monier-Williams, from an Assistant Equipment Officer; June 5th, 1916.

Flying Officers (Observers).—Temporary Capt. F. P. Don, Sco. Horse Yeo. (T.F.); June 16th, 1916. June 28th, 1916: Temporary Second Lieut. J. A. R. Buller, 12th K.R. Rif. C., and to be transferred to the General List; Temporary Second Lieut. G. B. Crole, R.A., and to be transferred to the General List; Temporary Second Lieut. R. Bell Irving, R.E.; Lieut. D. Carruthers, Canadian A.S.C.; Second Lieut. W. O. P. Winmill, Bedf. R., and to be seconded; Second Lieut. B. K. B. Barber, North'd Fus., and to be seconded; Temporary Second Lieut. C. Arkle, General List. June 29th, 1916: Temporary Lieut. A. T. A. Nesbitt, Conn. Rang., and to be transferred to the General List; Lieut. J. M. Tyrrell, R. Ir. Fus., Special Reserve, and to be seconded. July 1st, 1916: Lieut. G. W. Devenish, R.A., and to be seconded: Lieut. K. Mackenzie, Sea. Highrs., Special Reserve, and to be seconded; Temporary Second Lieut. R. V. Kann, R. Sc. Fus., and to be transferred to the General List; Temporary Second Lieut. G. C. Twining, General List.

The following appeared in a supplement to the *London Gazette* issued on July 16th:—

Wing-Commander.—Capt. (Temporary Major) P. B. Joubert de la Ferte, R.A., and to be Temporary Lt.-Col. whilst so employed; July 1st, 1916.

Squadron-Commanders, from Flight-Commanders.—Major J. G. Weir, High. Brig., R.F.A. (T.F.); June 22nd, 1916. And to be Temporary Majors whilst so employed.—Lieut. (Temporary Capt.) E. J. Bannatyne, 19th Hrs.; July 1st, 1916. Capt. T. A. E. Cairnes, 7th D.G.; July 2nd, 1916. Capt. R. R. Smith-Barry, Special Reserve, July 3rd, 1916.

Assistant Equipment Officer.—Second Lieut. H. G. H. MacSwiney, Special Reserve; May 18th, 1916.

Memoranda.—N.C.Os. to be Temporary Second Lieutenants (on probation) for duty with the R.F.C.: 2nd Class Air-Mechanic Fritz Bowyer, from R.F.C.; June 17th, 1916. Sergt. Reginald W. Settle, from A.S.C.; June 21st, 1916. Sergt. Percy Francis, from Sea. Highrs. (T.F.); June 22nd, 1916. 1st Class Air-Mechanic Thomas V. Brake, from R.F.C.; June 23rd, 1916. 2nd Class Air-Mechanic John R. Evans, from R.F.C.; June 25th, 1916.

Supplementary to Regular Corps.—To be Second Lieuts. (on probation): Walter B. Kellogg; June 10th, 1916. June 19th, 1916: Gastrill B. Wilkins, Erle F. B. Curtiss, William E. Bousfield, Maurice Myers, John Y. de la C. Elliott, and Herbert Weakley; June 19th, 1916. Stanley Clark; June 28th, 1916. Maurice A. Benjamin, Austin E. Neal, Douglas Welch, Frank S. Smith, Hon. Charles E. St. G. Caulfield, Joseph W. Gardner, Forrest G. Parsons, Arthur B. Drewery, Raymond Baltus, William L. Alison, Patrick S. Leigh, Herbert D. Pashley, Maurice R. Helliwell, Charles H. Bell, James Mitchell, Lewis Sloden, William D. Thom, Gordon T. Pettigrew, James Gardner, Frederick A. D. Grace, Mervyn C. Mossop, Philip M. Haarer, Charles A. M. Furlonger, Thomas A. J. Guyatt, John J. Dunne, Russell G. Robson, Harold E. Ward, Ronald E. Littell, Gerald H. Foley, John Doxey-Parkinson, George V. Cottam, Clement A. Pike, Leonard M. Barlow, Edwin A. Mearns, and William B. Melville; July 8th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 17th:—

Assistant Equipment Officers.—Second Lieut. G. F. Randall, Hamps. R. (T.F.); July 2nd, 1916. July 4th, 1916: Second Lieut. H. D'O. Beningfield, Special Reserve; Second Lieut. A. L. Jurd, Special Reserve.

Memoranda.—To be Temporary Second Lieuts. for service in R.F.C.; July 8th, 1916: Pte. Francis Bissicks, from Inns of Court O.T.C.; Pte. William Henry Irvine, from R. Fus.

Supplementary to Regular Corps.—Second Lieuts. (on probation) confirmed in their rank: P. Pralle, G. A. Lascelles, H.D'O. Beningfield, A. L. Jurd, and G. P. Alexander.

To be Second Lieuts. (on probation): Ernest A. Salt; July 1st, 1916. Philip L. Wood, Rodney Stubbs, James Rimmer, Herbert Simson, and Basil H. Godfrey; July 8th, 1916.

MENTIONED IN DESPATCHES.

IN a supplement to the *London Gazette*, published on July 13th, is given a despatch from General Sir Charles Monro giving the names of officers and men mentioned for distinguished and gallant services during the period of his command of the Mediterranean Expeditionary Force. Among them are:—

Royal Naval Air Service.—Commander C. R. Samson, D.S.O., R.N., Wing-Commander, R.N.A.S.; Lieutenant-Colonel E. L. Gerrard, R.M.L.I., Wing-Commander, R.N.A.S.; Lieutenant R. B. Davies, V.C., D.S.O., R.N., Wing-Commander, R.N.A.S.; Captain H. Fawcett, R.M.L.I., Acting Wing Commander, R.N.A.S.; Flight-Lieutenant G. L. Thomson, D.S.C., R.N.A.S.; Flight-Commander H. Stanley-Adams, R.N.A.S.; Midshipman E. K. H. St. Aubyn, D.S.C., R.N.; Second Lieutenant W. B. Jones, R.M.; Flight-Lieutenant E. A. O. Auldjo-Jamieson, R.N.A.S.; Carpenter J. J. Brownridge, R.N., Warrant Officer, First Grade, R.N.A.S.

In the same supplement is a list of officers and men brought to notice by Maj.-Gen. C. V. F. Townshend, C.B., D.S.O., in connection with operations under his command in Mesopotamia. Among them appear:—

Royal Naval Air Service.—Flight-Lieutenant V. G. Blackburn, D.S.C.; Flight-Lieutenant A. K. Robertson; Mr. G. D. Nelson, Warrant Officer, 2nd Grade.

Royal Flying Corps.—Second Lieutenant E. J. Fulton, 1st Duke of York's Own Lancers (Skinner's Horse); Captain S. C. B. Mundey, Oxf. and Bucks. L.I.; Captain H. Petre, Commonwealth Mil. Forces; Captain T. W. White, Commonwealth Mil. Forces.

With reference to the list of officers and men mentioned in despatches, which appeared on page 541 of "FLIGHT" for June 29th, an official correction has been issued to the effect that the name of Flight Sub-Lieutenant Isaac Henry Woolf Barnato, R.N.A.S., should be substituted for the name Flight Sub-Lieutenant Isaac Henry Woolf, R.N.A.S.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Killed (*July 10th*).

Flight Sub-Lieutenant Victor Nicholson, R.N.
Probationary Midshipman Bernard W. Davy, R.N.R.

Accidentally Killed (*July 14th*).

Probationary Flight Sub-Lieutenant Edmund A. Freeman, R.N.

Injured (*July 9th*).

Probationary Flight Sub-Lieutenant Paul O. Gadbois, R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Captain G. A. Burney, Yeomanry and R.F.C.
Second Lieutenant A. G. T. Cruickshank, R.G.A., attached R.F.C.
Second Lieutenant J. W. Halcrow, Dorset Regt., attached R.F.C.
Second Lieutenant R. Sherwell, Lincoln Regt., attached R.F.C.

Previously reported Missing, believed Killed, now reported Killed.

Lieutenant J. R. Dennistoun, Canadian Div. Cyclist Co., attached R.F.C.

Died of Wounds.

Second Lieutenant C. T. H. Vaisey, Royal Flying Corps.

Died.

4231 Corporal J. Smith, Royal Flying Corps.

Wounded.

Second Lieutenant P. R. Meredith, Royal Flying Corps.
Second Lieutenant H. S. Paynter, E. Surrey Regt., attached R.F.C.
Second Lieutenant J. H. Ross, Royal Flying Corps.
Lieutenant H. O'N. de H. Seagrove, R. Warwick Regt., attached R.F.C.
Lieutenant W. Stobart, Durham L.I., attached R.F.C.
Second Lieutenant T. A. Tillard, Yeomanry, attached R.F.C.
2592 Sergeant H. N. Johnson, Royal Flying Corps.

Missing.

Second Lieutenant W. F. L. Castle, Royal Flying Corps.
Second Lieutenant S. H. Ellis, Royal Flying Corps.
Second Lieutenant W. B. Ellis, A.S.C., attached R.F.C.
Lieutenant D. H. Gray, Royal Flying Corps.
Second Lieutenant N. P. Tucker, Indian Army Reserve of Officers, attached R.F.C.
Major F. F. Waldron, Hussars, attached R.F.C.

Believed to have been Taken Prisoner at Kut-el-Amara.

Second Lieutenant C. H. Courthope-Munroe, Indian Army, Reserve of Officers, attached R.F.C.

Previously Officially reported Missing, now Unofficially reported Prisoners of War.

10805 2nd Class Air-Mechanic E. R. Coleman, Royal Flying Corps.
4995 1st Class Air-Mechanic P. Shaw, Royal Flying Corps.

The following officers have been reported by the Base as believed to have been taken prisoners at Kut-el-Amara. Official lists have not yet been received from the Turkish Government:—

Captain R. D. de la C. Corbett, Indian Infantry, attached R.F.C.
Captain S. C. B. Mundey, Oxford and Bucks. L.I., attached R.F.C.
Captain T. R. Wells, Indian Infantry, attached R.F.C.

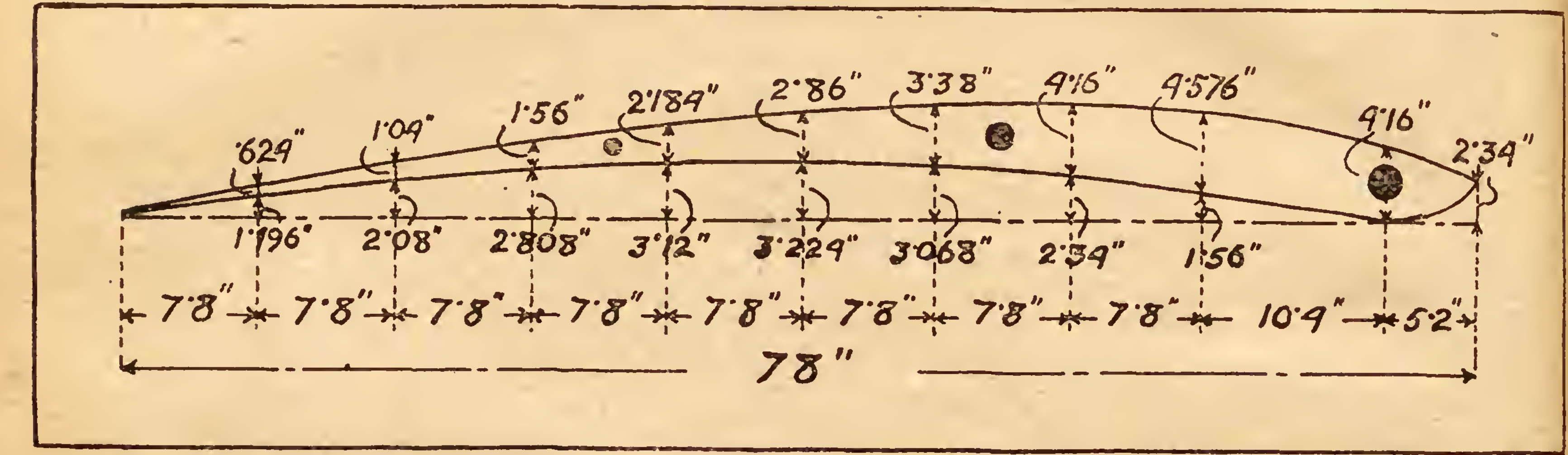
Fatal Accidents.

A FATAL accident occurred at Farnborough on Monday evening. A machine piloted by Sec. Lieut. W. B. Power, R.F.C., was seen to side-slip, and nose-dive to the ground, the pilot being instantly killed.

While flying over the Hounslow district soon after 6 p.m. on Tuesday evening, an aeroplane suddenly crashed to the ground in the cemetery. The wreck immediately burst into flames, and the pilot and observer were burnt to death.

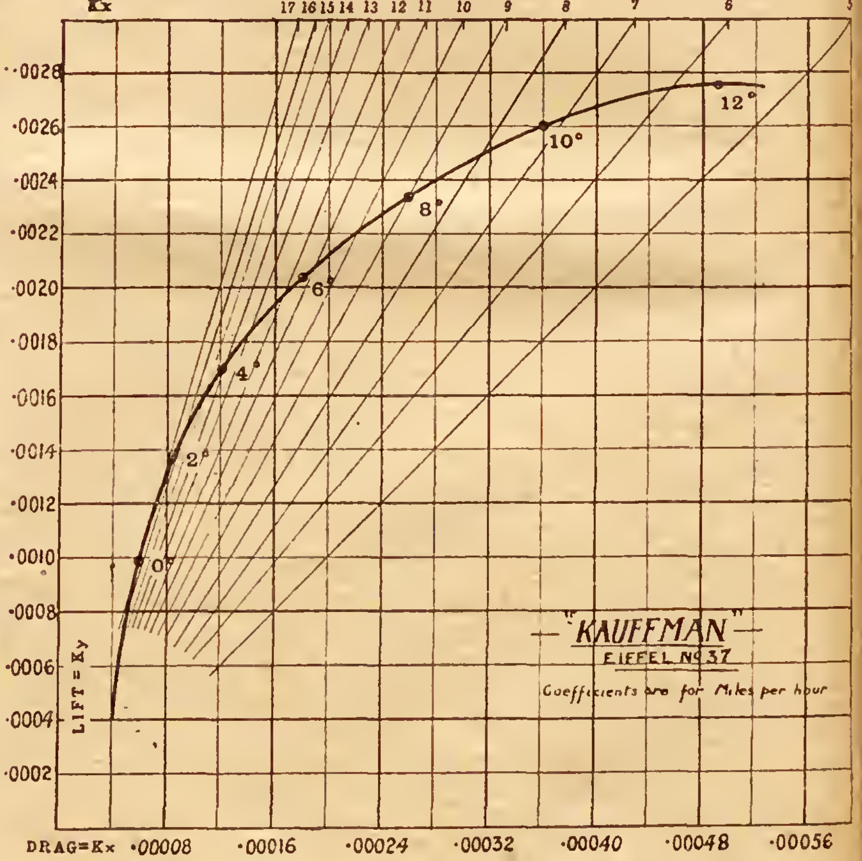
THE C.E. TRANSCONTINENTAL TRIPLANE.

With the coming of the large-sized aeroplane the question of multiplanes at once suggests itself as being a means of overcoming many of the problems involved. Apart from the obvious advantages as regards construction and weight-saving this arrangement of lifting surfaces offers, there is, we believe, much to be gained aerodynamically. Since the early, and by no means unsuccessful, efforts of A. V. Roe, little has been done in the way of triplanes, or machines having a greater number of lifting surfaces, and it is only recently that designers appear to be turning their attention in this direction. An interesting example of one of these efforts is to be found in the large C.E. Transcontinental triplane built at Anderson, Ind., U.S.A., some particulars of which have appeared in our American contemporary, *Aerial Age*. Although this machine is essentially a large one, having over 1,000 sq. ft. of lifting surface, it will be seen from the accompanying scale drawings that by virtue of the arrangement of the planes the overall dimensions are by no means abnormal, the length being 32 ft. 6 ins., and the span 59 ft. It has been designed for use over both land and water, a four-wheeled running gear being fitted to the boat-like body. The latter consists of a rectangular *fuselage* constructed of ash and spruce longitudinals and struts, which tapers to a horizontal knife-edge at the rear and to a point at the front. The whole body is strongly wire braced, and is given a streamline shape by means of formers and stringers, and a covering of three-ply spruce and a single layer of specially treated cloth. Provision is made for eight passengers, who are totally enclosed by the body, vision being obtained by means of windows.

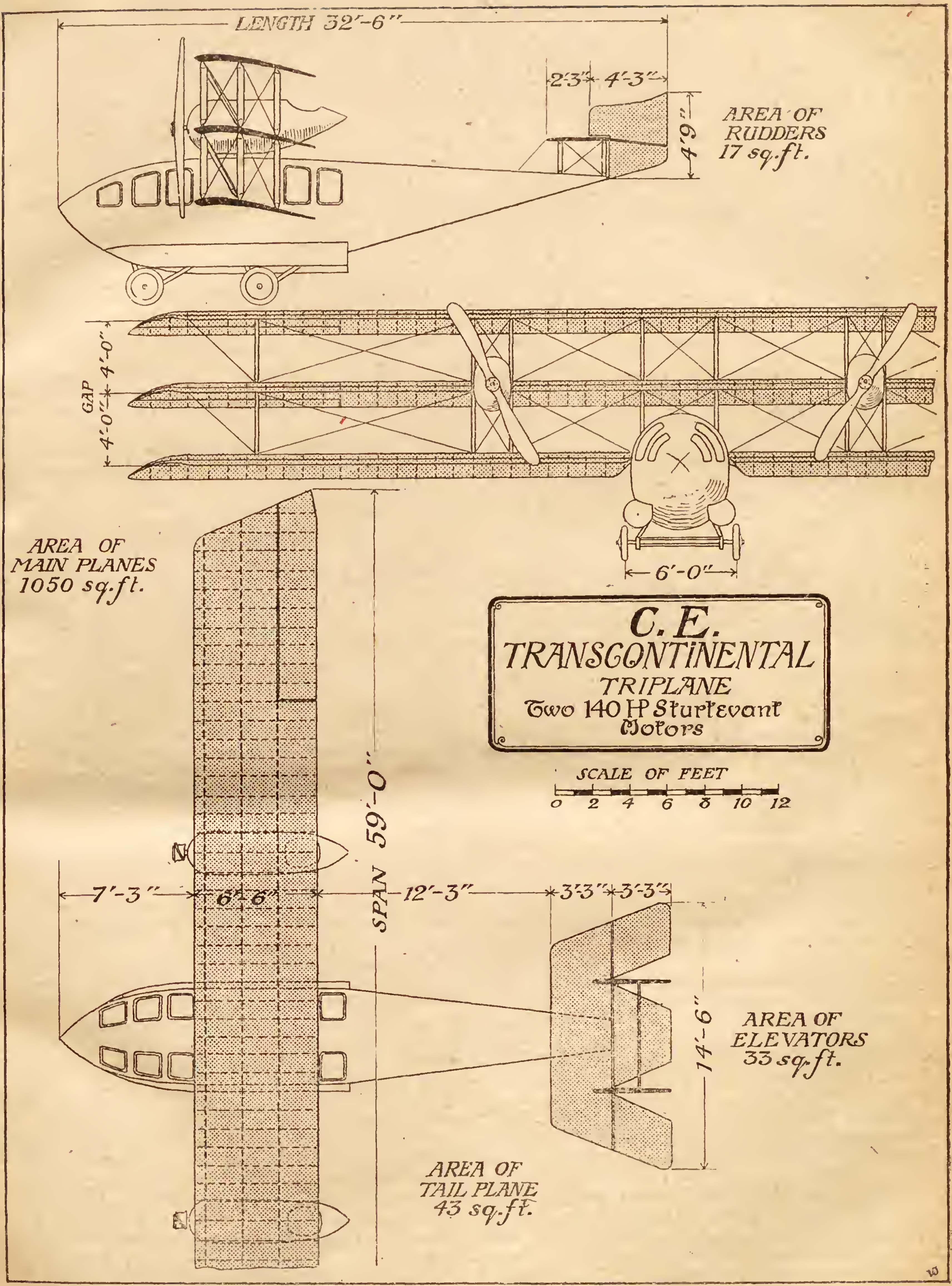


A section of one of the wings (Kauffman) used in the C.E. Transcontinental triplane.

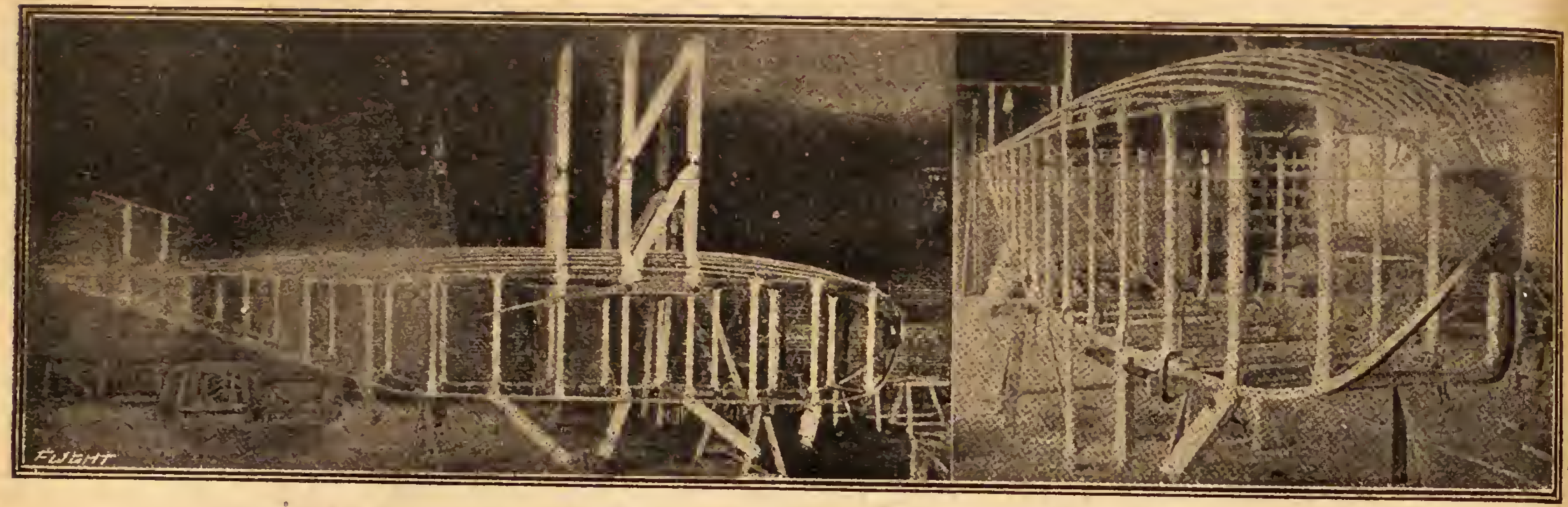
The most interesting feature in the design of this machine, however, is to be found in the main planes. It will be noticed that the gap is exceptionally small in comparison with the chord—far too small, we should say, to get the best results from the planes. The wing-section employed is that of Kauffman (Eiffel No. 37), which compares favourably with the best wing-sections of to-day. It is doubtful, however, if the designers of the C.E. triplane have taken full advantage of its characteristics, for apart from the question of the small gap previously referred to, the normal angle of incidence given (8°) does not appear to be the best under the circumstances. A section of the wing used on the C.E. triplane with dimensions is shown in one of the accompanying illustrations, whilst the general characteristics of a similar model section tested at the Eiffel Laboratory are also given. The planes are built up on two main tubular steel spars with $\frac{3}{4}$ spruce battens nailed and glue to hollow laminated birch and mahogany webs. Som 2 ft. 4 ins. from the trailing edge is a third spar. Th interplane struts are arranged in sets of three—a stru from each spar—in all, eight sets or 24 struts betwee each plane. In the centre the top and middle plane are supported by two sets of struts each, the lower one being mounted on the body, to which the lower plane i attached direct. Level with the middle plane, one on eithe side of the body, are the two engines, 8-cylinder 140 h.p Sturtevants. These are housed in streamlined laminated wood *nacelles*, each of which carries a passenger—presumably to look after the engine. Located in each of these *nacelles* is a 30-gallon fuel tank, fed from the six 40-gallon tanks located in the body of the machine by a special vacuum-feed system. The engines are coupled direct to tractor screws about 10 ft. in diameter. *Ailerons* are hinged to the extremities of the top and middle planes only, and a stabilising plane of some 43 sq. ft. area is



Curve giving lift, drag, and lift/drag coefficients of the Kauffman wing section as used on the C.E. Transcontinental triplane.



THE C.E. TRANSCONTINENTAL TRIPLANE.—Plan, side and front elevation to scale.



Two views of the body of the C.E. Transcontinental triplane in course of construction.

mounted above the stern of the body slightly below the line of thrust. Hinged to the trailing edge of the tail plane is the elevator, which is divided into three by the two partly balanced rudders. Both elevator and rudder controls, as well as that of the *ailerons*, are incorporated in one operating column.

It is intended to build a second machine after the first one has gone through its air tests, and in this second machine steel will be used practically throughout. The principal characteristics of the first C.E. triplane are as follows :—

Span, 59 ft. ; chord, 6 ft. 6 ins. ; gap, 4 ft. ; area of main planes, 1,650 sq. ft. ; overall length, 32 ft. 6 ins. ; weight complete, 5,500 lbs. ; speed range (calculated), 48–98 m.p.h. ; climbing speed, 900 ft. per min. ; petrol capacity, 300 gallons.

* * * *

FROM THE BRITISH FLYING GROUNDS

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Straights with instructor last week : Messrs. Drew, Edwards, Ward, Duncan, Mills, Lyles, Callard, Hodgkinson, Saunders and Jamie. Circuits with instructor : Messrs. Rodocanachi, Cockell and Stevens. Eights with instructor : Messrs. Mulville, Keymer, Goodhart, Parkinson, Phillips, Wellinkar, Donald and Kay. Instructors : Messrs. Hale, Biard, Manton, Pashley, Winter and Russell.

Brevet taken during week : Mr. Turner.

Beatty School.—The following pupils were out during last week : Messrs. Gliksten, Venables, Whitmore, Kay, Hoskins, Dowding, Davy, Edwards, Jones, Murdoch, Garlick, McPherson, Mitchell, Towson, Elliott, Austen, Rudd, Curry, White, Sach, Owen, de Wilde, Wood, J. Squires, D. C. Squires and Gadsden.

The instructors were Messrs. G. W. Beatty, G. Virgilio, A. E. Mitchell, and H. Fawcett ; the machines in use being Beatty-Wright dual control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes.

Certificates were taken during the week by Messrs. A. W. Kay, P. S. Whitmore and A. E. Venables on Beatty-Wright biplanes and by Mr. W. E. Jones on a Caudron biplane.

Hall School.—Pupils out last week :—With P. G. Allen (late R.F.C.) : Lieut. Packman, Orton, Barton, Smith, Yuill, Dutton and Course. With C. M. Hill : Skinner, Capt. Deane, Duncan, Sergt. Cottrell-Jones, Collier, and three passenger flights by Dutton, Maude and Yuill. Hall and Caudron (Government type) tractor biplanes in use. Royal Aero Club certificates taken by Mr. Skinner and Capt. Deane.

London and Provincial Aviation Co.—Pupils rolling last week : Messrs. Egerton and Lewis. Doing straights : Messrs. Bush, Daly, Leman and Mander. Ticket practice : Messrs. Jones and Sivewright, Mr. W. R. Jones being ready for "ticket." Extra practice : Mr. J. A. Turner. Instructors : Messrs. W. T. Warren, M. G. Smiles, L. H. Brake and W. T. Warren, jun.

Machines in use : Three tractor biplanes.

Ruffy-Baumann School.—Pupils with instructors last week : Trubridge (15 mins.), Homes (68), Babington Smith (16), Wilson (37), Bebee (49), Williams (1 hr. 10 mins.), De Balme (18 mins.), Thomas (35), Carr (25), Barnes (65), Durand (10), Fanshawe (20) and Capt. Bailey (15). Pupils going alone for circuits and figures of eight : Durand and Wilson. Instructors : E. Baumann, F. Ruffy, A. Thomsen and A. Baumann. 60 and 50 h.p. Ruffy-Baumann biplanes in use.

E. Baumann, A. Baumann and Thomsen out on Saturday afternoon.

Bournemouth School.

PUPILS rolling alone : Messrs. Kennedy, Brandon, Turner, Hinchliff, Pritt, Green, Wingfield, J. B. Smith, Ross and Wilmot. Doing straights alone : O. Wilson, Smith, Adamson, Daniel, Scaramanga, Hammersley, Little and Fenn. Half-circuits alone : T. Wilson and Barlow. Instructors : Messrs. S. Summerfield and Brynildsen. 35, 45 and 60 h.p. Caudrons in use.

Although the weather was very unkind, quite a lot of school work was accomplished, and the usual exhibition flights were carried out by Mr. S. Summerfield, who was ably assisted by E. Brynildsen.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL GENERAL MEETING.

Notice is hereby given that a Special General Meeting of the Club has been convened by direction of the Committee pursuant to Rule 33, and such meeting will be held at the Club premises, 166, Piccadilly, London, W., on **Thursday, July 27th, 1916, at 7 p.m.**

AGENDA.

To make the following alterations in Rule 50, as indicated in heavy type:—

> "Rule 50.—The subscription for Members **for the year 1917 and thereafter** shall be **£5 5s. 0d.** per annum, or such other sum as may be decided upon in General Meeting, and the entrance fee *£2 2s. 0d.*, or such other sum as the Committee may from time to time determine."

New Club Premises.

At the Special General Meeting of the Members of the Royal Aero Club, held on February 17th, 1914, at which Brig.-General The Marquess of Tullibardine, the Chairman of the Club, presided, Colonel Sir Capel Holden reported the result of the replies to the circular issued to Members in October, 1913, with reference to new club premises, when 980 replies were received as follows:—

673 in favour of new premises and an increased subscription.
238 against.
69 in favour of new premises but against an increased subscription.

At the conclusion of a general discussion, the following resolution was carried unanimously:—

> "Resolved that the Committee be empowered to take steps to acquire new premises by lease or purchase on such terms as it may think proper in the event of a favourable opportunity arising."

Owing to the outbreak of War the arrangements for acquiring a Club House could not be completed, but in view of the fact that the present premises are entirely inadequate for the purposes of the Club and unworthy of the controlling organisation in aeronautics in the British Empire, the Committee thinks that one or other of the suitable premises which have now been offered to the Club should be acquired.

The Committee feels that the utility of the Club is seriously reduced by its not being more suitably housed so that its Members can meet under more favourable conditions. In the present premises the Club is without a dining-room and bedrooms, which is a great disadvantage. If the Club had this accommodation it would be very useful to Members, and especially to Service Members on short leave who now constitute a large and rapidly-growing proportion of the Members of the Club.

It is impossible to run such premises satisfactorily unless the present annual Subscription is raised, and the Committee is of opinion that to meet the necessary expenses the amount should be increased to *£5 5s. 0d.* The Committee feels confident that the great majority of the Members will be glad to embrace this opportunity of rendering practical assistance in furthering the cause of aeronautics.

July 18th, 1916. B. Stevenson, Assistant Secretary.

SPECIAL COMMITTEE MEETING.

A Special Meeting of The Committee was held on Wednesday, the 12th inst., when there were present: Prof. A. K. Huntington, in the Chair; Mr. Griffith Brewer; Mr. Ernest C. Bucknall; Lieut.-Col. Mervyn O'Gorman, C.B.; Flight-Commander C. F. Pollock, R.N.; Mr. T. O. M. Sopwith; and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Lieut. Vivian Gaskell Blackburn, R.N.
Lieut. Eldred Wolferstan Bowyer-Bower.
Second Lieut. Walter Horace Carlyle Buntine, R.F.C.
Flight Sub-Lieut. William Reginald Dainty, R.N.
Maurice Dullfus.
Flight-Commander Christopher Draper, R.N.
Lieut. Henry Duveen, R.N.V.R.
Flight Sub-Lieut. Samuel Denys Felkin, R.N.
Arnold Gabriel.
Kenelm Edward Lee Guinness.
Flight-Lieut. Philip Leslie Holmes, R.N.
Flight-Lieut. Peter Legh, R.N.
Hugh Lewis.
Second Lieut. C. Home McCall.
Lieut.-Col. Walter Grant Petersen Morden (Canadian Staff).
Capt. Arthur Payze, R.F.C.
Lieut. John Alan Guy Swaine, R.F.C.
Major Charles Hillsborough Remington Taylor (4th Essex Regt.).
Capt. Hugh Tomlinson, R.F.C. (S.R.).
Lieut. Hugh Claude Wakefield, R.F.C.
George Leonard Wilford.

Temporary Honorary Member.—On the motion of the Chairman, Mr. Berkeley Powell was elected a Temporary Honorary Member of the Club for two months, viz. to September 12th, 1916.

THE FLYING SERVICES FUND
administered by
THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to July 11th, 1916...	10,753	11	11
Collected at the Westland Aircraft Works, Yeovil (Fortieth contribution)	0	15	9
Staff and Workers of Gwynnes, Ltd. (Nineteenth contribution)	8	4	5
Collected by Mrs. Anderson	21	5	6
Total, July 18th, 1916	10,783	17	7

B. STEVENSON, Assistant Secretary.
166, Piccadilly, W.

New German Zeppelins.

If the *Daily Telegraph* correspondent at Copenhagen is to be credited Darmstadt is now a central flying and airship station, the most important in Germany. In the shed there are ten Zeppelins and a great number of flying machines. He goes on to say that "the Zeppelins recently built are 820 ft. in length, with a gas capacity of 190,675 cubic feet. In the hull is provision for machine-guns and for light pieces of ordnance. The newest Zeppelins are stated to have four armour-plated cars, of which the first is the heaviest.

All the cars are fitted with guns. Armour-plated gangways connect the cars. The engines indicate 4,000 h.p., and the speed is 57 miles an hour. The airships can reach a height of over 13,000 ft."

A Schütte-Lanz at Constantinople.

A report was received at Amsterdam on July 16th from Constantinople, that a Schütte-Lanz dirigible arrived at Constantinople on the previous day, the arrival causing great enthusiasm.

German Seaplane Wrecked.

A trawler reported at Ymuiden, on July 11th, having encountered a German seaplane, No. 549, afloat but with a broken screw. The two occupants asked to be towed to a point six miles from the coast, and while the seaplane was thus being towed they came on board the trawler. After a couple of hours two other German seaplanes approached. One flew off to get assistance, and the other took up one occupant of the wrecked seaplane. Two other machines arrived and took up the second man of the disabled seaplane, which then sank.

AERONAUTICS AT THE N.P.L.

In the annual report for 1915–16 of the National Physical Laboratory there are the following references to work in connection with aircraft :—

Engineering Department.

The Resistance of Wood to Reversals of Stress.—In connection with an investigation of the strength of aeroplane wing spars, it was desirable to know the fatigue strength of the spruce of which the spars were made. As no data bearing on this could be found, it was decided to make some fatigue tests by the ordinary Wöhler method. To carry out these tests successfully, it was necessary to devise a method of holding the wood in a chuck so that it would not gradually work loose under the action of the reversals of bending moment. After several trials a satisfactory form of chuck was made, which would grip the specimen without danger of its becoming loose after a few hours' running. In preparing the specimens care was taken that the distribution and the thickness of the growth rings in each section should be nearly the same.

The results of the tests are given in the following table :—

Test No.	Range of Stress. lbs. per sq. in.	Total Number of Alternations.	
12	±2,510	5,920,000	Slight crack visible
		12,740,000	Crack extended
		16,860,000	Cracked all round, and failed
13	±1,970	16,250,000	Small crack visible
		23,010,000	Failed
14	±1,625	125,700,000	No apparent crack

It appeared, therefore, that the limiting resistance of this material to alternate tension and compression was above 1,600 lbs. per sq. inch, and below 1,970 lbs. per sq. inch. It was predicted, therefore, that for spruce of this quality the safe range of stress under reversals of bending was approximately ± 1,800 lbs. per sq. inch, or one-quarter of the ultimate stress, which was found to be 6,800 lbs. per sq. inch. In this respect spruce appears to be at a slight disadvantage compared with mild steel, in which the safe limit of stress under similar circumstances is generally about one-third of the ultimate stress.

Aeronautics Department.

Equipment.—The channels provided for aerodynamic research and described in the Reports of the Advisory Committee for Aeronautics, have been maintained in full working order throughout the year. Requests for further tests became so numerous and pressing, to a large extent owing to the war, that two new air channels, 4 ft. and 7 ft. in diameter, have been put in hand and are now almost completed. This additional equipment, and the necessary buildings, provided in response to the wishes of the Admiralty and the War Departments, have been undertaken by H.M. Office of Works, except for the aerodynamic balances and scientific apparatus, some of which has been made by the Cambridge Scientific Instrument Company, and the remainder by the workshop staff of the Laboratory.

The offices originally provided had become insufficient for the greatly increased staff, and in the new buildings suitable office accommodation has been allowed for. A description in some detail of the new building is given in an Appendix to the Report (p. 78).

The chief equipment of the division now consists of two 7 ft. channels, two 4 ft., and one 3 ft. channel, a whirling area 60 ft. in diameter, and a small water channel for photographic records of the flow of fluids.

The two new wind channels follow generally the lines of the older channels, which continue to be satisfactory in use ; some improvements in detail, suggested by previous experience, have been introduced, and in the larger of the two some modifications of the channel itself have been made in order that a larger motor and a higher wind speed might be employed.

The new equipment is now coming into use, but during the last year the amount of experimental work carried out with the older equipment has appreciably increased, partly as a consequence of additional staff, but mainly owing to special efforts on the part of the staff to deal with the greater urgency of the problems arising from the war. It is almost impossible to compare the experimental work with that of previous years, the tests now being of a special character. The continuous investigation, which has hitherto been the main feature of the work of the division, has been continued where possible.

Not only is the scope of the experimental work in the aeronautics division rapidly increasing, but the requests for tests in each section become more numerous. New lines of enquiry have been suggested by the recent work, but in many cases detailed prosecution of the lines of investigation thus opened has had to be deferred to a period of less pressure.

Experiments on Airship Models.—The more important object of the experiments on airship models has been the determination of the effect of the fin area on the restoring couples which follow a displacement. The problem of producing a stable airship is one of considerable complexity, and the mathematical analysis is being proceeded with at the same time as the experiments, the analysis following the lines which proved successful in the case of the aeroplane.

A somewhat allied investigation has been made into the conditions necessary for the equilibrium and the stability of kite-balloons ; the effect of the kite wire introduces constraints of a character not investigated in connection with airships and aeroplanes, and the conditions for stability are correspondingly more complex. Both the airship and the kite-balloon experiments were undertaken in connection with the full scale experiments carried out by the Admiralty.

Experiments on Models of Aeroplane Wings.—In addition to experiments on special aerofoils, a series of experiments has been carried out on the modifications necessary to the wing of an aeroplane, which must both fly at high speed and alight at low speed, the latter being determined by the character of the ground in the fighting areas. Experiments have also been made in relation to the properties of aerofoils forming a biplane combination, the experiments being an extension of earlier experiments, with more modern sections for the aerofoils. The existence of the 7 ft. channel has made it possible to extend the experiments on aerofoils to larger sizes and speeds, and it appears that at the higher speeds and sizes the results closely approach those of the actual aeroplane wing. For most purposes, however, the small channels give results which differ little from those furnished by the seven-foot channel at its highest speed.

Experiments on Models of Complete Aeroplanes and Seaplanes.—The experiments on complete models during the year were greater in number than during any previous period of a year, and were directed mainly to the investigation of the stability and controllability of aeroplanes in flight. The problems arising from the increased air forces relative to the pilot's strength, as the size of aeroplane is increased, have required careful examination of the balancing of the control surfaces. The prediction from the models is fully justified by the results of the tests on the completed aeroplanes.

Tests on Aeroplane Bodies.—Many special forms of body have been tested, in connection with the various dispositions of the gun in an aeroplane, or the special duties of the machine. Other experiments have been made on the combination of body, tail plane and elevator, fins and rudders, the whole forming an important part of the structure in relation to the stability of the aeroplane.

Stability of Aeroplanes.—The previous mathematical analysis of the disturbed rectilinear motion of an aeroplane has been extended, but the chief addition during the year has been the examination of the stability in circling flight, either horizontal or in a spiral. Some effects of the interaction between the longitudinal and the lateral motions were shown to occur, and an estimate of the magnitude was given. The full analysis of the disturbed motion in curvilinear flight has not yet been attempted owing to pressure of other work.

Propellers.—Experiments have been made on a number of propellers, the thrust and efficiency being usually determined at a number of speeds of rotation and translation. A successful attempt has been made to transfer some of the test work from the whirling arm to the wind channels, the advantage to be gained in ease and accuracy of working being considerable. A particularly difficult experiment on the interference between the propeller of an aeroplane and the body was carried out in the 4 ft. wind channel, and further work in this direction will be undertaken from time to time. It is hoped that it will be possible shortly to construct a suitable propeller balance for use in one of the 7ft. wind channels.

Special Investigations.—Several investigations of importance were undertaken during the year, one of these relating to the possibility of obtaining high speeds in aeroplanes, and another to the relation between the design of a propeller and the engine to which it is to be attached. A considerable amount of work has also been done on the resistance and stability of aerial bombs. The most connected series of experiments in progress relates to the efficiency of radiators for aeroplanes, taking account both of the resistance and the rate of cooling.

New Work.

During the year 1916–17 it is hoped to commence the systematic study of steels and steel alloys, particularly for use in connection with aeronautics, while investigations regarding dopes and fabrics are proposed.

AVIATION IN PARLIAMENT.

Petrol for Testing Purposes, &c.

MR. GRANT on July 5th in the House of Commons asked the Chancellor of the Exchequer if the new duties on petrol apply to petrol for stationary engines used for such purposes as lighting?

The Chancellor of the Exchequer (Mr. McKenna): No, sir; though, of course, a licence for the supply will be necessary.

Mr. Peto asked the Chancellor of the Exchequer whether petrol used by motor and aircraft manufacturers for the purpose of testing machines on the bench, on the road, or in the air, is free from the new duty levied on permits for the issue of petrol; and, if not, whether he will insert words in the Finance Bill to that effect.

Mr. McKenna: The answer to the first part is in the affirmative, and the second part does not arise.

The Withholding of R.F.C. Officers' Names.

ON July 11th, Sir Arthur Markham asked the reason why the name of the aviator who shot down Immelmann has been suppressed by the Press Bureau; and why the names of airmen who distinguish themselves are not allowed to appear in the Press?

Mr. Ronald McNeill asked a similar question.

Mr. Forster: It has not been customary to mention in *communiqués* the names of officers or soldiers who perform acts of gallantry, but the matter is being further considered in consultation with the military authorities in France. The name of the aviator who brought down Captain Immelmann was not communicated to the Press Bureau for publication, and consequently there is no question of the bureau having suppressed the name.

Sir A. Markham: The name was actually sent by the *Daily Chronicle* representative to that paper and suppressed by the Press Censor, and the name was Second Lieut. McCubbin, aged 18½ years.

Mr. Forster: I am not aware of that. I was dealing with the allegation that the name had been suppressed by the Press Bureau.

Sir E. Carson: Cannot the hon. gentleman give us some indication as to what is the objection to giving the names?

Mr. Forster: If my right hon. and learned friend will cast his mind back to the earlier days of the war, he will remember—I think I am right—that it was the expressed desire of the officers of the R.F.C. that no mention of individual names should be made.

Mr. MacCallum Scott: Would it not be desirable, on the same grounds, to withhold the names of those upon whom the Victoria Cross is conferred.

Mr. Forster: The names of those upon whom the Victoria Cross is conferred are communicated by the Commander-in-Chief. The Commander-in-Chief, of course, will name any person whom he thinks specially deserving.

Mr. Pringle: Why should an exception be made in regard to these flying officers!

Mr. Forster: For one thing, I do not think the flying officers want it, and, in the second place, it is a matter which, I think, ought to be left largely in the discretion of the Commander-in-Chief.

On July 13th, Sir A. Markham asked whether only officers are engaged as pilots of flying machines on active service; and whether the officers so engaged intimated their desire that their names should not be mentioned in the despatches of the Commander-in-Chief when they had performed acts of gallantry which had received high commendation from the Commander-in-Chief in his despatches?

Mr. Forster: The answer to the first part of the question is in the negative. The name of any officer or man who is mentioned in the despatches of the Commander-in-Chief as having performed an act of gallantry is made public, but it has been considered desirable that the names of officers and men should not be published until the Commander-in-Chief has had an opportunity of considering the merits of the action performed, and comparing it with others which may be equally commendable although, perhaps, less sensational. As I intimated, the question is being further considered. In the work of the Royal Flying Corps particularly those actions which appeal to the public are not necessarily more commendable than many which are performed in the ordinary routine of duty, and only the Commander-in-Chief is qualified to judge the respective merits of each case. I feel sure my hon. friend will realise the justice of this decision. I think what I said in answer to a supplementary question the other day may have given rise to some misunderstanding. When I said that officers of the Royal Flying Corps wished that their names should not be published in the Press, I meant that they did not wish their names to appear in the descriptive articles furnished by newspaper correspondents. I was not referring to mention made by the Commander-in-Chief. That is an honour which officers of the R.F.C. prize as highly as any other officer in H.M. Service.

Air Inquiry Witnesses.

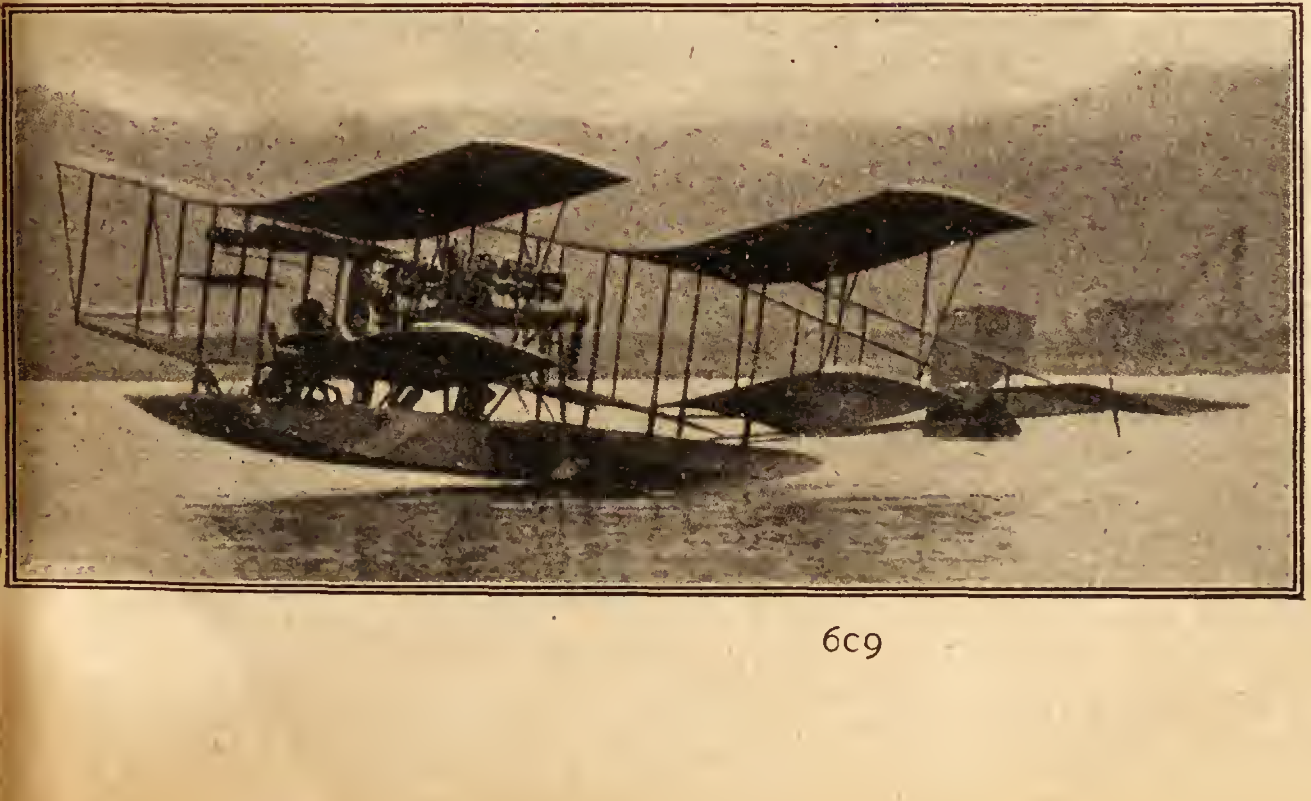
CAPTAIN A. H. BURGOYNE on July 13th asked the Financial Secretary to the War Office whether he has been informed that Driver McDonnell, of the Royal Aircraft Factory, was arrested almost immediately on his return from London, and is now detained at the recruits' depôt, South Farnborough; whether he is aware that this man was one of the witnesses who offered to appear before the Judicial Committee now sitting under Judge Bailhache; whether he is aware that a complete indemnity against victimisation was given in specific words by General Sir David Henderson and confirmed by the Judicial Committee; and whether, under the circumstances, on the identity of this witness becoming known, he can explain the causes of the arrest, and whether he will institute an inquiry into the circumstances of the case?

Mr. Forster: This question was only handed to me after I entered the House, and I have, therefore, had no opportunity of investigating the facts of this particular case. I understand, however, that a complete indemnity against victimisation was given by General Sir David Henderson, and I am quite sure that it will be respected.

Air Raids and Workmen's Compensation.

MR. CROOKS, on July 17th, asked the Prime Minister whether he is aware of the arrangement come to whereby the provisions of the Workmen's Compensation Act apply in cases of death or injury to railwaymen as the result of enemy raids or bombardments; and whether the Government will consider the advisability of the provisions of the Act being applied to all workmen who suffer death or injury from the same cause during the course of their employment?

The Under Secretary of State for the Home Department (Mr. Brace): I am informed that the railway companies have decided that men injured on duty during air raids or bombardments should be compensated on the same basis as under the Workmen's Compensation Act. In ordinary cases, however, where the workman is not exposed by reason of his employment to any greater danger from an air raid or a bombardment than the inhabitants generally, and the accident is not in any sense due to the nature of his employment, it would not, I think, be possible to place a liability in respect of any injury which the workman may suffer on the employer.



The Richardson tandem-plane, twin-motored hydro-aeroplane being tried near Washington, D.C. Two Robert motors are used. Mr. George A. Gray is the pilot. (*By courtesy of "Aerial Age."*)

THE R.F.C. INQUIRY.

AT the resumed public sitting of the R.F.C, Inquiry Committee on July 11th neither General Henderson nor Mr. Pemberton Billing were present.

Lord Montagu of Beaulieu, who had already given evidence, submitted a tabulated document comparing the R.A.F. 90 h.p. engine with other types, and contended that these showed the R.A.F. engine to be the most extravagant in consumption of petrol and the heaviest per horse-power of six typical engines. He also read a letter from a manufacturer's point of view, which stated that a large number of 200 h.p. engines had been ordered without efficient test being made.

He said that he proposed to call two witnesses, relying upon the intimation by General Sir David Henderson that their position would not be prejudiced.

The Chairman said the promise was General Henderson's. The members of the Committee could neither prejudice nor do anything else to the position of those gentlemen.

Lord Montagu: You consider I am safe in relying on that promise?

The Chairman: We think so, yes.

Lord Montagu added that the witnesses desired to remain anonymous.

The first witness, whose name was written down by Lord Montagu and handed to the Chairman, was referred to as "Mr. A." He stated that he had had long experience in textile manufacture and in engineering and had managed works in England and America. He had been at the Royal Aircraft Factory for four or five weeks, having gone there to learn.

Lord Montagu: Have you noticed whether material is wasted or not?—Oh, yes, a tremendous lot of scrapping, quite excessive. It is reported—of course, I cannot prove it—that 27,000 pieces were scrapped in June.

General Sir H. Smith-Dorrien: Finished pieces, or pieces which did not come up to specification?—Some possibly are half-finished.

The Chairman reminded Lord Montagu that a separate committee under the chairmanship of Sir Charles Parsons had inquired into the Aircraft Factory, and the present inquiry was not concerned with the factory except in the matter of design and manufacture. They were not inquiring into the administration of the Aircraft Factory.

Lord Montagu: That is one point I criticised very strongly, and was asked to bring evidence about.

The Chairman: There has been an independent inquiry about that.

Lord Montagu: I am going to show by my witnesses that that inquiry did not learn the truth that they should have learnt.

The Chairman: We cannot inquire into an inquiry.

Sir Charles Parsons pointed out that if there were 27,000 parts scrapped they would want to know how many parts altogether were made in the month. In the best regulated workshops there was a lot of scrapping through workmen's carelessness. It spoke for nothing.

Lord Montagu: There have been several visits of committees to the factory, and two visits by the King?—Yes; and special instructions were given on these occasions to keep the machines busy in all the shops. Parts of aeroplanes were fixed up to look real, and soon after the King left some of the shops were as empty as they had been before he came.

In other words, there was a good deal of window-dressing?—Yes, a very great deal.

Mr. A—— declared that there was a lack of supervision of persons going in and out of the shops, and that on most fine afternoons the men played cricket. This went on until it became too thick altogether, the men were found out, and six or seven of them dismissed.

The Chairman: Playing cricket in Government time?—Yes, every day they were doing it. Then again there was an extraordinary number of "dud" mechanics. I should say that 25 per cent. of the men employed in the Royal Aircraft Factory are really good men, 50 per cent. are just ordinary people, and the other 25 per cent. are "duds." A lot of them came there to avoid military service; indeed, several actually told me they did.

All sorts of jobs were given to all sorts of men. An ordinary carpenter was appointed a "viewer" for instance. "I don't think," said Mr. A——, "that a carpenter is a competent man to pass material." Another viewer was a jeweller's assistant from Birmingham, and a lorry driver was given the important job of drawing wires.

Mr. Balfour Browne: What is a viewer?—A viewer is a man who inspects material before it is put into the machine.

Lord Montagu: Will you tell us something about the proportion of foremen to workmen?—I never saw a place with so many foremen. The general way of putting it at the Royal Aircr Factory is, "One man, one foreman."

Mr. Balfour Browne: We really cannot inquire into this.

Lord Montagu: Surely this sort of evidence affects the efficien of engines and the quantity of the output?

Witness said that he did not get enough work, and he had met man who had been at the factory for two years and who was leavi because he was "fed up." He was a plumber, and said that had not done a real day's work in the two years.

Until recently men were paid for bad work as well as good, that there was no incentive to turn out first-class work except the good name of the factory. There was now a rule that work w not paid for until it had been inspected.

An order would be given, say, for forty aeroplanes. Material them would be obtained, and then when ten had been made orde would come down to do no more, whereupon the material for th balance of unfinished machines would have to be "sold cheap."

It was commonly reported that materials which had been scrapp had been buried.

Lord Montagu: Is there anything to prevent men taking thing out of the factory?—No. It is reported that one man, who wore big coat with big pockets, had taken out enough parts to put engine together.

What is your general impression of the works?—The works a fine. The machinery is tip-top, and cannot be better. If I wante a man, and he said that he had worked for three years in the Ai craft Factory I should say that I did not want him. A good ma would be made lazy. Men are not fully employed, and overtim is worked when there is no necessity. Take my own case an example. If it is fine weather in the evening I go out and se the country on my motor-bike. If it's raining I go into the factor and draw overtime pay. I think it is monstrous the way in whi this business is conducted.

It was stated that the witness had only been at the factory four weeks, and the Chairman refused to hear him about matte that had occurred before that time.

The Chairman again told Lord Montagu that the Committe were not inquiring into the administration of the factory owing the fact that an independent committee had inquired into the matte He said that they were not prepared to hear any more witnesses that character.

Lord Montagu: I think it is a pity that you do not hear co roborative evidence as to the special preparation made for the vis of the King.

The Chairman: We do not want any more evidence.

Lord Montagu: May I take it that you do not contest that poin

The Chairman: You can only take what I have said.

Lord Montagu: I have a witness here who specially prepare the factory for the visit of the King and the Committee, and he ca speak first hand on that point, showing that the factory wa "faked" for the purpose. If the Committee do not wish to he him there is no more to be said. I have my own remedy to mak it public through other channels.

Lieutenant Whitehouse, R.N.A.S., was next called. He ga evidence when the Committee was sitting *in camera*, but desir publicity for his statement, and therefore attended again.

His evidence was a denial of the statement that when a R.F.C machine fell into the sea at Dover he prevented two of his office going to the assistance of the pilot, and reprimanded and punish them for so doing, and that he refused to render assistance to safe land the aeroplane.

Witness explained that the machine alighted about 50 yards fro the shore in 3 ft. or 4 ft. of water. A party equipped with wade for handling seaplanes waded out to the machine, and a motor- also. He did not know then whether the aeroplane belonged the Naval service or the Flying Corps. He only gave orders th the skilled ratings were not to knock off their work, because would have meant delay in work on machines which were urgent required. The aeroplane was towed in, and subsequently R.F. mechanics came and took it apart, loaded it on a lorry, and took to their aerodrome. The officers he reprimanded were two wh left their station without his permission or orders in the motor-boa There was no question of saving the life of the pilot. The pil did not even get wet, and could easily have waded ashore. Ther fore the statement that he said the pilot ought to have stayed the and drown was absurd. As to the ill-feeling between the tw services it might or might not exist. As far as he knew it did no Before and after this incident several R.F.C. machines had be salved.

Dr. R. Glazebrook, Director of the National Physical Laborator and Chairman of the Advisory Committee for Aeronautics, ga technical evidence regarding the stability of aeroplanes. Asked if the B.E. 2 C was an efficient and satisfactory machine, the witness replied, "Thoroughly." It was not easy, he said, to combine all the qualities that were required in an aeroplane in one design, and the B.E. 2 C was a compromise in the matter of climb, speed, and engine power. The "R.A.F." designs were the result of careful scientific study of the problems of aviation. The evolution of the B.E. 2 C would have been impossible without the assistance obtained through the experimental work at the National Physical Laboratory.

Professor Petaval, professor of engineering at Manchester and member of the Advisory Committee for Aeronautics, stated that the B.E. 2 C. was more easily controlled than many others, and had many advantages.

General Arbuthnot, chairman of the Aerial League, and formerly superintendent of the Small Arms Factory at Enfield, expressed the opinion that it would be better to fight Zeppelins with aeroplanes than by building Zeppelins for the purpose.

Second Lieutenant W. T. Blake, assistant adjutant at Farnborough when Lieutenant Littlewood started to fly to France on June 1st, on a new machine, which eventually landed in the German lines at Lille, said that they were instructed that two officers would report, Capt. Archer and another pilot, name not mentioned. The witness had selected an experienced mechanic who had flown across half a dozen times to go as an observer, when a telephone message came either from the War Office or the 6th Brigade that Capt. Grant, a Staff officer, was to go over to France on that day, if possible, in an F.E. machine. When Capt. Grant arrived Capt. Archer had gone, and he was allotted to Lieut. Littlewood, who had to take him to St. Omer. The adjutant who took the message was seriously ill, and the witness did not know where it actually came from. It was a frequent occurrence, after an observer had been selected, for a staff officer to be sent down to go across to France in an aeroplane.

Colonel O'Gorman, Superintendent of the Royal Aircraft Factory, explained in detail many technical points in connection with engines and designs, and afterwards stated that it was not true that a large number of engines that had been ordered were not tested.

Witness asked permission to reply to the statement that cricket was played in Government time at the factory. There was a piece of ground on which men played in their own time, and on one Saturday four men who had not signed on were playing cricket. Two men who had signed on, and were in the Government's pay at the time, joined them. They were dismissed. That was the only occasion he knew of on which cricket had been played at improper times. It might often happen that men were playing in their own time, while others close by were at work.

Replying to Mr. Bright, Colonel O'Gorman denied absolutely that any design of any sort had been copied at any time from private firms by the R.A.F. He did not know the witness whom Lord Montagu had called in regard to waste at the factory and other matters. He did not know what work he did in the factory; he had seen him strolling about occasionally. He accepted the statement respecting 25 per cent. of the workmen being "duds," and took credit for his scheme of the dilution of labour in time of war. He was letting every fit man go out that he could spare, and was making shift with the best operatives he could get.

Colonel O'Gorman referred to the other "curious charges," but was reminded that the evidence had been ruled out. As to the alleged "window-dressing," he explained that the King's visit took place shortly after His Majesty's accident, and in order that he should not have too much walking, certain aeroplanes were moved out. A few things were arranged to make it a little more easy for Royalty to see.

Mr. Balfour Browne: That is all the window-dressing that took place?

Witness: Yes. The same thing was done when General Sir H. Smith-Dorrien came down.

With regard to the statement that scrapped parts were buried, he said that one of his predecessors was "a great magpie," and buried old material, such as old wheels, gun slides, and lumps of iron, to remedy the boggy state of the ground.

The Committee then continued taking Col. O'Gorman's evidence *in camera.*

On the following morning Major Dawes was called to give evidence in reference to No. 29 squadron of aeroplanes, which left Gosport for France in March last, and to which an accident happened.

Major Dawes said that ten of the twelve machines left Gosport and six had a forced landing in this country owing to a snowstorm which they encountered. In four cases the machines were broken, and two officers were injured. Two machines left from Hendon, and these arrived at Dover and Folkestone.

The Chairman: It is suggested that the pilots asked to be allowed to test the machines, and they were refused. Do you know anything about that?—No, I know nothing about it. I cannot imagine the request being made.

This was rather a disaster, was it not?—It was.

The sort of thing one would not expect to happen?—No.

The kind of thing that ought not to happen?—It should not happen.

Can you give any explanation of why it did happen?—I do not think that it would have happened if they had not run into this very heavy snowstorm.

Is a snowstorm sufficient to account for it in your opinion?—Not altogether.

It should not have had such a disastrous effect, should it?—No.

Making full allowance for the snowstorm, what do you think, in addition, was the cause of this disaster?—Really the fault was that the pilots had not sufficient experience to meet what they had to meet on that journey. Had the weather held up they would have been quite all right; but, meeting this heavy snowstorm, they had not sufficient experience to compete with it. A snowstorm is a very nasty thing to meet on this type of machine. Two pilots who had had a considerable amount of experience and had been to France, came to grief. There was one case of engine trouble, and the pilot came down between Shoreham and Hastings. I do not think the two machines from Hendon which arrived safely at Dover and Folkestone passed through the snowstorm.

Witness said that as far as he was aware no inquiry was held. He could not say whether the pilots were examined as to the causes of their accidents.

The Chairman pointed out that the reports spoke of 26 or 27 machines being "consumed," that is, rendered unserviceable or damaged; what became of the remainder?

Witness replied that he knew that five machines were collected to replace those broken, and he believed that one or two of these were broken at Dover.

The Chairman: I should have thought that a happening of that kind would have created considerable stir in the Flying Corps, and that some inquiry would have been held. That strikes me as rather strange. You don't know of any inquiry?—Not as far as I am aware. The occurrence took place in March of this year.

Mr. H. Franklin, chief examiner at Hendon, gave evidence regarding the allegations made by Mr. R. F. Curtis, an inspector, of the falsification of time-sheets. He said that up to January 23rd the hours of inspectors were from 8.30 a.m. to 7.30 p.m., but they did not arrive at the stated hour, and they were allowed to go when they had finished the work they had in hand. Their wages were £2 10*s.* per week. Then from January 24th the hours were fixed at 48 for £2 10*s.*, and the men were paid overtime.

The Chairman: That was a pure gift from somebody unasked and without agitation.—Yes.

Somebody you did not know suddenly gave a present of a considerable sum of money to these people?—Yes, sir.

Do you think that sounds very likely? How does it strike you?—Well, it was so. We were told that overtime was to be paid from January 24th.

And they all said: "Thank Heaven for that"?—Yes, it was nice to have it.

Can you account for the fact that after this alteration the men worked regularly from 8.30 to 7.30?—I cannot understand it.

Does it not seem rather suspicious?—On the face of it, yes.

The Chairman: Then if Curtis signed his time-sheet for the actual hours he worked the time-sheets of the other men would look very suspicious?—I do not know about that at all.

Why didn't you ascertain what the other men signed for?—I thought it was so trifling that I did not take any trouble to find out.

Witness denied that he saw Curtis and said to him, "Cannot you see that you are letting the other chaps down?" At the request of the Chief Examiner, Curtis was removed from the station. He afterwards became ill, and a draft letter was found on him.

Colonel Bagnall-Wild, Chief of the Aeronautical Inspection Department, explained in detail the method of timekeeping at Hendon, and said the change was made because he could not get men at £2 10*s.* per week, and he could not compel them to work more than 48 hours a week, as it was a condition of their engagement. All overtime after 48 hours was voluntarily undertaken. The 8.30 to 7.30 day merely represented the length of day fixed upon as being necessary to get through the work. It varied at different stages, according to the amount of work coming through. The overtime rate was granted because it was difficult to get men at the old rate, and he felt he could not ask them to do overtime on a voluntary basis. The step also conformed to the trade custom. At first there were about fifty inspectors, and now there were 2,000 at all the controlled works. Several examiners, Curtis amongst them, refused to work overtime, saying there was no justification for it. The witness considered Curtis's allegations were totally unfounded, and he denied that the inspection was bad.

The Chairman said that the substance of the letter found on Curtis was that he complained that whereas he himself signed his time sheets for the actual time he worked, the other men signed for the regulation hours; that complaint had been made against him because he signed for the actual hours, thereby casting doubt on the other men; and that he had been asked to sign the same as the other men, whether he worked the hours or not.

After inspecting the time sheets, the Chairman asked witness if his suspicions were not aroused by the extreme regularity of the hours and the uniformity with which the men put down 8.30 to 7.30.

Colonel Wild replied in the negative, adding that he took steps to check the time. Curtis would not work overtime.

The Chairman remarked that Curtis's statement was that there was no justification for overtime, and that the men ostensibly wasted their time.

Colonel Wild: He made that statement, and I consider it unjustified.

Colonel O'Gorman, recalled, was asked by the Chairman to explain the use of dope which was said to be poisonous at the factory. The witness stated that complaints came from the Home Office that the dope used was "giving trouble all over the place." The dope used up to July, 1914, contained a substance of a poisonous nature which kept it soft and prevented cracking when placed on the wings. Efforts were made to obtain a dope containing less poison, and the danger had been greatly diminished. Better regulations as to its use had also been adopted. A material, which he called X, because he did not believe it was known abroad, was discovered to be a non-poisonous substitute, but it was a by-product of the dye industry, and was not obtainable in the whole of England. It was now being produced, but not in sufficient quantities yet.

Mr. Butcher called Colonel O'Gorman's attention to a statement put in by Lord Montagu on Tuesday that in regard to the manufacture of aeroplane engines the R.A.F., instead of encouraging British manufacturers to build engines, had tried to keep the monopoly in their own hands.

Colonel O'Gorman: There is absolutely no truth in the statement—not a shadow of truth in it. Nothing but a distortion o attempts to help people, he said, could be made to look anything like that. Engines had been mothered by the R.A.F.

The Chairman said that the criticism directed against the factory put an "S" before the word mothered.

Colonel O'Gorman: I have not built more than four experimental engines at the factory, and there is no kind of monopoly as regards construction. Of aeroplanes we have produced something less than 2 per cent. of the total. If we had attempted to secure the monopoly for the manufacture of engines we should have been cutting our own throats, seeing that we could not produce anything like the number required.

The Chairman: The fact that you employ over 4,000 men has led people to suppose that you are a large producing factory. What is the necessity for so many persons being employed if you have only produced four experimental engines and 77 aeroplanes?

Colonel O'Gorman replied that the R.A.F. did all the jobbing work for the Flying Corps, making every kind of "oddment that anybody at any time could not make or get." War wastage, for instance, was very great, and they had to make spares for the machines at the front. All the material made in the factory was made by hand and not manufactured. The word "factory" was a little misleading; it was a laboratory on a full scale. Various engineers belonging to manufacturing firms had made countless visits to the factory, and they knew there was no competition. The functions of the factory were experimental and jobbing, and instructional and development work was carried on. A large amount of experimental work, practical and theoretical, was also carried out at the factory, the results of which were at the disposal of manufacturers. They experimented in chemistry as well.

The Committee afterwards sat in private, and adjourned *sine die.* It is understood that no further evidence will be taken in public, and that an interim report is likely to be issued.

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R.A.F. Employee in Trouble.

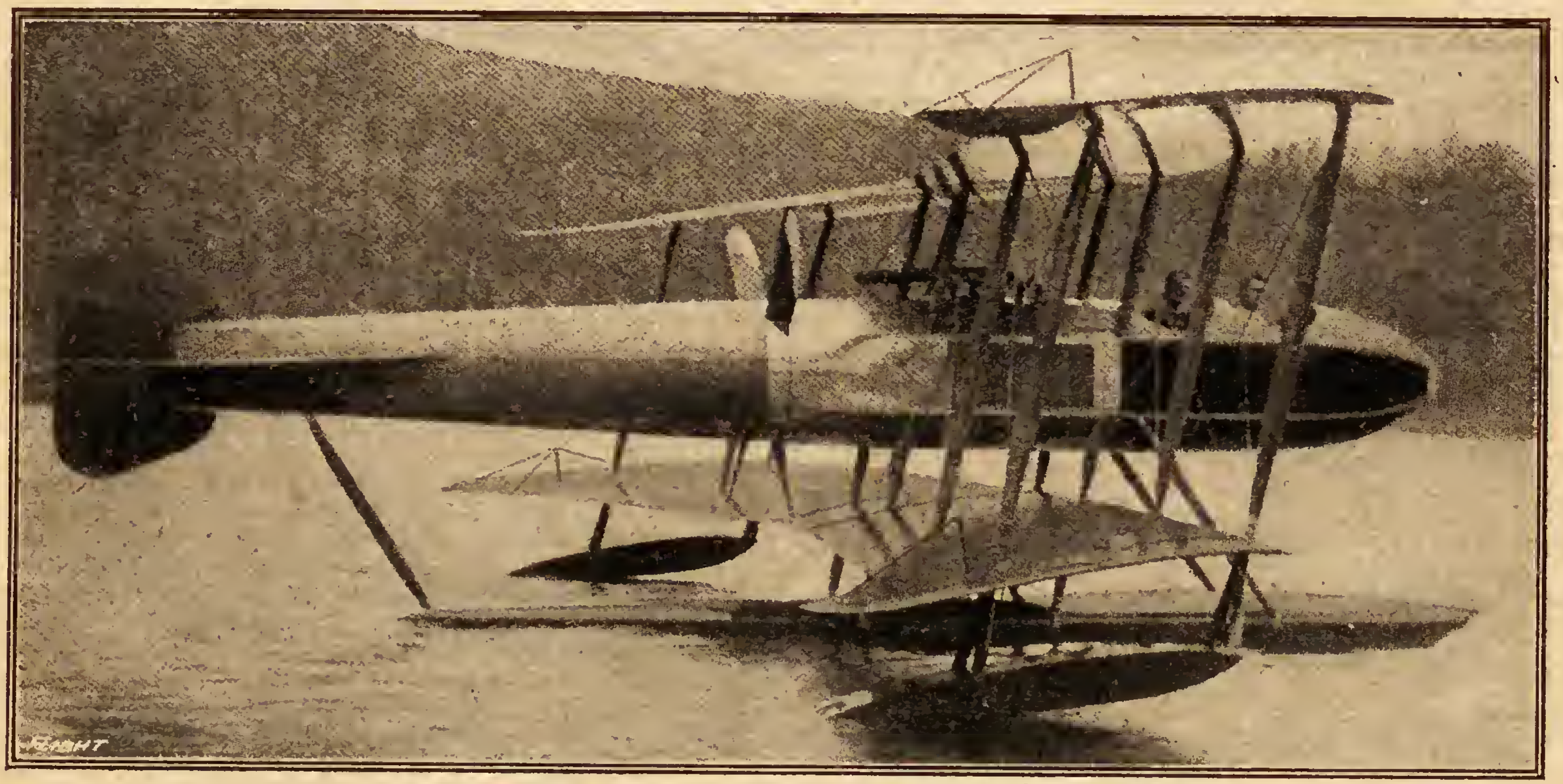
AT Aldershot on July 14th Driver McDonnell, A.S.C., employed at the Royal Aircraft Factory, Farnborough, was charged before Mr. R. Simmonds with stealing Government property (aeroplane parts), and further with being in unlawful possession of the same. After formal evidence he was remanded.

Later in the day McDonnell was brought before Mr. W. T. Robertson and remanded until Thursday, being admitted to bail on his own recognisances in £50.

Military Service Act and the R.N.A.S.

IT is authoritatively stated that the Navy Group system is still open, and that men who have joined the Navy Groups for the Royal Naval Air Service cannot be charged as absentees under the Military Service Act. All enquiries relative to the Royal Naval Air Service should be addressed to the R.N.A.S. Recruiting Office, Brook Green, Hammersmith, W.

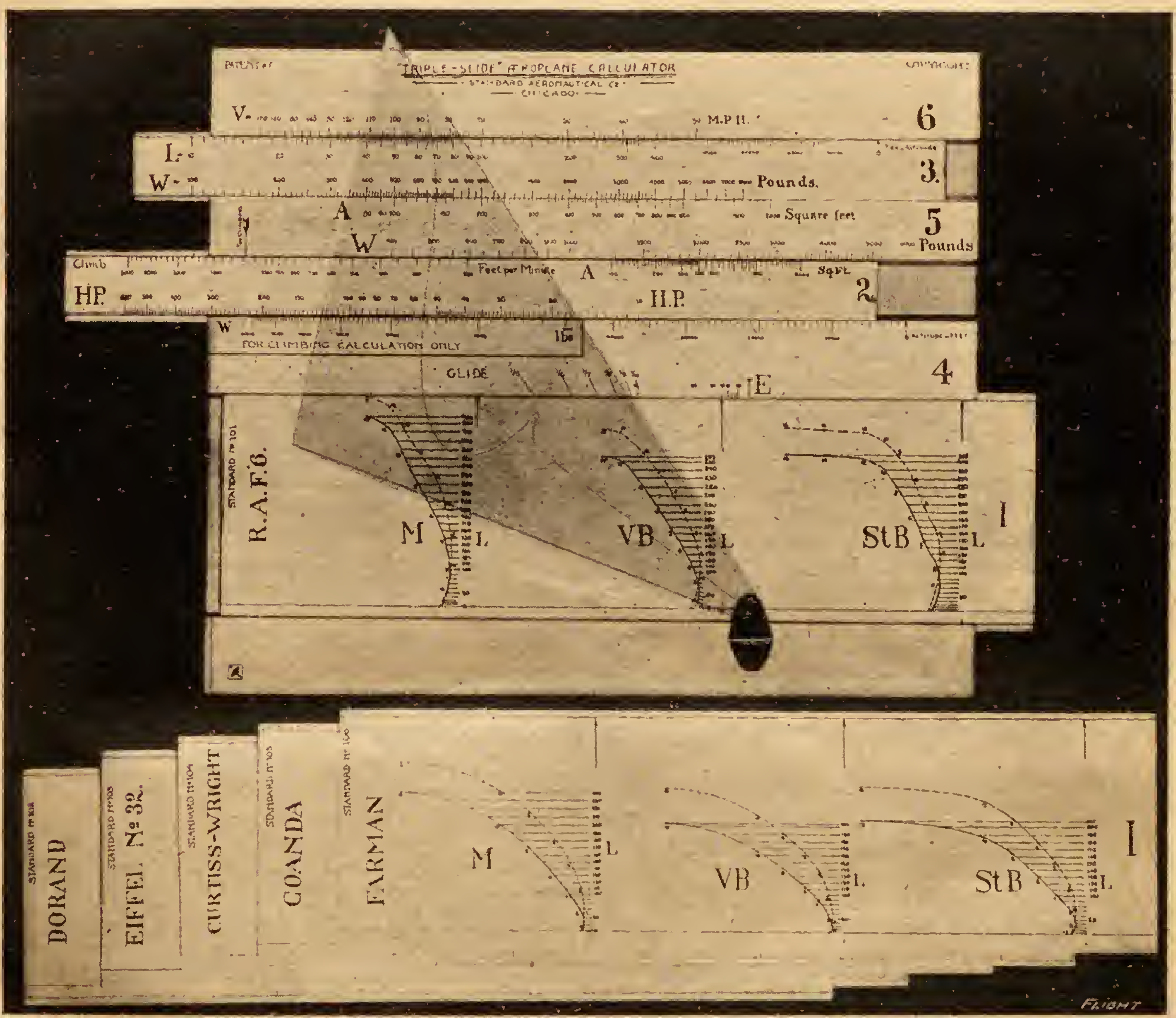
It is stated, however, that men who have appealed for exemption from Army service are eligible in the Navy only for *immediate* service.



AN INTERESTING EXAMPLE OF A PUSHER *FUSELAGE* BATTLE SEAPLANE FROM AMERICA.—The principal features of this machine, which has been built by the Gallaudet Co. of Norwich, Conn., for the U.S. Navy, consist of the arrow-form wings, and the four-bladed propeller (driven by two 150 h.p. Duesenberg motors) bisecting the *fuselage.* A clutch connection between each engine and the propeller enables either one or both engines to be used. A speed of 100 m.p.h. is claimed with both engines running, and 70 m.p.h. with one engine. Machines embodying this form of propulsion were designed several years ago by M. Coanda (Bristol), and M. Pateras Pescara, both of which were tested at M. Eiffel's laboratory, whilst other examples are to be found in the Borel and Blériot pusher monoplanes of 1912-3, and the Grahame-White Military biplane of 1913. (*By courtesy of "Flying."*)

THE "TRIPLE-SLIDE" AEROPLANE CALCULATOR.

WHEN the ordinary engineer's slide rule was first introduced many people were inclined, and some still are for that matter, to shrug their shoulders at it, and regard it as an ingenious and rather amusing toy, not adapted, however, for any serious work. Although some of the objections raised against it—such, for instance, as lack of accuracy—were to some extent justified as regards the smaller sizes, the fact remains that the slide rule is now used extensively in all engineering offices, where it effects a considerable saving of time, and has, in the larger sizes, been found quite accurate enough for all practical purposes.



The "Triple-Slide" aeroplane calculator.

The "Triple-Slide" aeroplane calculator manufactured and sold by the Standard Aeronautical Co., of 224, S. Jefferson Street, Chicago, Ill., U.S.A., has been designed to supplement the slide rule for the special calculations involved in aeroplane design. In principle it is founded on the interdependence of the characteristics of the wing section employed, the weight, area, resistance and horse-power of the machine.

The instrument consists, as will be seen from the illustration, of a base numbered 4, 5, and 6, and of three movable slides numbered 1, 2, and 3. Slide No. 1 is the wing curve slide, and on it are printed three curves for the particular section in question. The first gives the lift coefficient for a monoplane (M.), the second the lift coefficient for a vertical biplane (V.B.), and the third that for a staggered biplane (St. B.). The biplane values, it will be seen, are arbitrary, and are for one value of gap and stagger only, but as in most modern machines there appears to be a tendency towards uniformity in gap and stagger, the figures given will probably be sufficiently accurate for ordinary purposes. For each of the three types there are two curves, one full line and one dotted, both marked at intervals with figures indicating the angle of incidence. The dotted line is to be used only in calculating the gliding angle, the full line for all other purposes. On the right hand side of each scale is the lift coefficient L.

Slide No. 2 is known as the power slide, and is used in all calculations where the horse-power is a factor. In a similar way slide No. 3, the speed slide, is used for all calculations where speed is a factor. A turnable indicator in the form of a celluloid triangle is pivoted at a point near the bottom of the base of the instrument. On this triangle are drawn two lines, one straight and one curved. The straight line is used in connection with the full lift curve of the wing section, and also in calculating the gliding angle from the dotted curve, while the curved line is used to intersect the h.p. on slide No. 2.

As the wind resistance of the machine is an important factor in the calculations, it is necessary to know the resistance of the aeroplane under consideration. As this is not always known, a table is given in the book of instructions accompanying every instrument, in which are given the detrimental head resistances of a number of various types, ranging from an equivalent normal area of 6 sq. ft. for a small fast monoplane to 20 sq. ft. for a twin-engined battleplane. These figures are, of course, only approximately correct, but for first estimates the error involved is probably not of serious moment. That they are not and cannot be absolutely accurate will be realised when it is remembered that no allowance is made for variation of resistance of items in the slip stream according to the amount of slip given by the particular propeller used. In the tables of head resistance is not included the resistance of the supporting surfaces, and in order to obtain what the inventors of the instrument call the "efficiency of construction," designated on the base of the calculator by the letter E, it is necessary to divide the area of the main planes by the number of square feet of detrimental head resistance. If, for instance, the area of the main planes is 400 sq. ft., and the detrimental head resistance is 10 sq. ft., the efficiency of construction E is 400 ÷ 10 = 40.

A list of some of the characteristics that may be calculated by means of the "Triple-Slide" will give an idea of the usefulness of this instrument. The speed at any angle of incidence, the landing speed, the climbing speed per minute, the maximum attainable altitude, and the speed at this altitude, the economical speed, minimum and maximum speed, minimum horse-power, greatest possible flying weight and useful load, gliding angle, &c.

A numerical example of one of the calculations that can be made by means of the "Triple-Slide," although not explaining the complete manipulation of the instrument, will give a good idea of the simplicity of the operation. Let us suppose that we have a machine weighing 2,000 lbs. "all on," with an area of 400 sq. ft., and an engine developing 100 b.h.p. The wing sectio is the R.A.F. 6, and the machine is a vertical biplan In the book of instructions the detrimental area given as 10 sq. ft., which may be considered sufficientl accurate. Taking the propeller efficiency as 75 pe cent., which is a fair average, we obtain 75 as the pr peller horse-power. The "Efficiency of Construction = E = A/DH = 400/10 = 40. On slide 1 we connec the arrow with E40. On slide 2 connect W2000 wi A400. On slide 3 connect W2000 with A400. Tur the indicator until it intersects HP on slide 2 at 75. is found that the indicator intersects the full line win curve on slide 1 at L80. On slide 3 L80 is connecte with V78·6, which is the maximum speed. The highe value of L on the full line wing curve is found to be 25 On slide 3 we find L255 connected with V44·2, which the minimum speed. The speed range is, therefor 44·2 to 78·6 m.p.h.

If it is desired to find the gliding angle of the sam machine as above, all the slides are kept in the sam position, and the indicator is turned tangent to the dotte line wing curve. The indicator will then be found t intersect (4), the base of the instrument, at 1/7. Th gliding angle is, therefore, 1 in 7.

With each instrument is furnished a set of standar wing curves complete for calculations of monoplan vertical biplane and staggered biplane, comprising th following sections: Eiffel No. 32 (Lanier Lawrance Eiffel No. 35 (Commandant Dorand), Eiffel No. 3 (Coanda), R.A.F. 6, Farman, and Curtiss Wright. Extr slides can be furnished at a dollar each, if they are sections tested at a laboratory, or designers who ar using their own section will be furnished with a laborator test of same and a slide, for $55, provided they supply model of their section measuring 3 ins. by 18 ins. Th price of the "Triple-Slide" aeroplane calculator with standard set of wing curves is stated to be $15 (about £ for the first fifty purchasers, and after that $25.

We understand that arrangements are being made fo an agent in England, and that the instrument will be o the market here very shortly.

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AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *General Headquarters, July 11th,* 12.48 *p.m.*

"In continuation of my report on the aerial combats of Sunday, one of our aeroplanes was shot down by a direct hit from an anti-aircraft gun, and three other machines have not returned to our lines."

8.30 *p.m.*

"Apart from a number of guns hidden in houses buried by *débris* and the like, we have in the course of these operations brought in 26 field guns, 1 naval gun, 1 anti-aircraft gun, and a heavy howitzer, while the number of German prisoners captured exceeds 7,500."

July 12th, 1.32 *p.m.*

"Several combats took place in the air on the 10th, as a result of which we destroyed one German machine, while one of our own machines was brought down by the enemy's gunfire."

General Headquarters, July 13th, 2 p.m.

"Despite the unfavourable weather, our aeroplanes have been constantly at work. Hostile machines were active, but all their attacks on our aeroplanes operating over the German lines were driven off. One of our aeroplanes is missing."

War Office, July 13th.

"*Mesopotamia—Tigris Line.*—On the evening of the 11th the enemy's artillery and aircraft were both engaged in an ineffectual bombardment of our trenches. No material damage was done. On 12th the temperature was 117 deg."

French. *Paris, July 12th. Evening.*

"In the region of the Somme our aeroplanes fought 14 action yesterday. Four enemy machines, badly hit by our machine guns were forced to dive suddenly. One of our pilots brought h machine, which was on fire, back to our lines and landed withou accident.

"Our bombardment squadrons were active last night. Tw hundred and twenty bombs were dropped on various stations where great excitement was observed, particularly the stations o Ham, La Fère, and Chaulnes."

Paris, July 14th. Evening.

"In reprisal for the bombardment by the enemy on the ope town of Lunéville on the night of June 24th one of our airmen, fly ing at a height of 1,500 ft., last night dropped several heavy bomb on the town of Mülheim (east bank of the Rhine)."

Paris, July 16th. Afternoon.

"In the region of the Somme our aeroplanes displayed grea activity. Four German machines attacked by ours over the enem lines were brought down. Two others, badly hit, were obliged t descend.

"In the region of Verdun one of our aeroplanes set fire to a captive balloon.

"During the night of the 15th one of our air squadrons bom barded the stations at Hombleux and Roisel, and a heavy batter near the latter. During the same night another squadron droppe numerous bombs on the stations of Abbecourt, Tergnier an Chaumy."

Paris, July 16th. Evening.

"On the morning of the 16th two enemy aeroplanes were brought down in the Somme region, one of them by Second Lieutenant Guynemer. This is the tenth aeroplane that this officer has brought down.

"During to-day Sergeant Rochefort brought down his fifth enemy aeroplane."

Russian. *Petrograd, July 11th. Afternoon.*

"Enemy airmen attacked the station at Zamirie, on the Minsk-Baranovitchi railway line, and dropped sixty-six bombs."

Petrograd, July 11th. Evening.

"The combats in the region of the Stokhod continue. Enemy aeroplanes are flying in great numbers above the rear of our armies, dropping bombs and opening fire with their machine-guns."

Petrograd, July 12th. Afternoon.

"German aviators have dropped bombs on the station of Zamirie and the town of Niesvij, where several houses were set on fire."

Petrograd, July 13th.

"There was an artillery duel. Some enemy aeroplane squadrons flew behind our lines, dropping bombs and firing with machine guns."

Petrograd, July 17th.

"A Zeppelin flying over Riga dropped 13 bombs on different quarters of the town."

Italian. *Rome, July 11th.*

"A semi-official statement says: This morning at daybreak some of our units effectively bombarded the enemy seaplane base at Parenzo (south of Trieste), in spite of the intense fire of the new defence batteries."

Rome, July 12th.

"Hostile aircraft dropped bombs on Latisana causing a fire, which was promptly extinguished.

"Our air squadrons on Monday bombarded Tione, in the Giudicaria, and on Tuesday the enemy's camps at Monte Rover, north-east of Lavarone. Our machines returned safely."

Rome, July 14th.

"Last night hostile aircraft dropped bombs on Padua. The damage was slight, but two persons were killed and a few wounded."

Rome, July 17th.

"On the 15th our aircraft bombarded the camps in the Folgaria area.

"Throughout yesterday the enemy displayed much aerial activity, bombarding several points in the Camonica and Adige valleys, but no casualties or damage ensued. Our batteries drove off some hostile aircraft which were making for Bergamo, Brescia and Padua. Last night five hydroplanes dropped bombs on Treviso, killing one person and wounding a few. One of the machines was brought down by our fire; the two occupants were killed."

German. *Berlin, July 11th.*

"Vigorous aerial activity resulted in numerous air fights, in which the enemy lost two machines on the Somme and two others west of Vouzieres.

"Near Courcelette, on the road from Bapaume to Albert, a British biplane was shot down by our anti-aircraft guns.

"Our air squadrons abundantly bombed troop transports near Horodzieja, on the line Baranovitchi-Minsk, and repeated their attack on the Russian dug-outs east of the Stodhod."

Berlin, July 12th.

"A British biplane was compelled to land in our lines near Athies. An enemy aeroplane fell down near Soyecourt, and another was brought down by our anti-aircraft guns near Chattancourt. Near Dombasle a captive balloon was shot down by our airmen.

"Our air squadrons made attacks east of the Stokhod. An enemy captive balloon was shot down."

Berlin, July 13th.

"North of Soissons a French biplane was forced to descend within our lines."

Berlin, July 14th.

"Our air squadrons successfully repeated their attacks east of the Stokhod."

Berlin, July 15th.

"Numerous bombs were dropped on railway stations where there was heavy traffic on the line Smorgon-Molodetchna. Trains conveying troops at the railway station of Kiverzy north-east of Lutsk were attacked by our air squadron, with good results."

Berlin, July 16th.

"West of Loos an enemy aeroplane was shot down by our infantry fire. It fell down within our entanglements, and a biplane, damaged by our anti-aircraft gun-fire, fell into our hands near Nesle."

Berlin, July 17th.

"On July 15th two further French aeroplanes were put out of action besides those announced yesterday, one in an air battle behind the enemy line south of the Somme, the other by being shot down from the ground near Preslincourt (Oise), on our front."

Austrian. *Vienna, July 12th.*

"Near Obertyn, in East Galicia, an Austro-Hungarian airman shot down a Russian Farman biplane.

"Our seaplanes bombed the military works and railway station at Latisana (north-east of Venice), causing several big fires."

Bulgarian. *Sofia, July 13th.*

"The enemy persists in his attempts to destroy the fruits of the labour of the peaceful population in the lower valley of the Mesta by daily dropping incendiary bombs with the object of burning the crops already cut. Owing to our effective measures he obtains no result from this means. The reconnoitring activity of our airmen increases daily, furnishing examples of praiseworthy activity."

Turkish. *Constantinople, July 15th.*

"An enemy biplane, pursued by one of our airmen, was forced to land in the island of Tenedos."

From Other Sources.

The Paris correspondent of the *Times*, writing on July 7th, says:—

"Nesle, Voyennes and Ham are other important railway centres to the south of Péronne, and upon these points the French aeroplanes have been actively engaged destroying railway buildings."

A telegram received in Paris from Salonica on July 11th says General Sarrail made an inspection in an aeroplane of the enemy's dispositions lasting three hours.

In a long despatch, dated "With the French Army on the Somme, July 13th," Mr. H. Warner Allen, the British press representative with the French Forces, says:—

"A fleet of aeroplanes, flying low, went forward with the French infantry. As a rule, the infantryman on the ground below watches the duel of airmen far away. In the Somme offensive, for the first time, aviators and infantry went into the battle close together, and each infantryman felt that he was in immediate communication with the aeroplane above his head. Many a soldier, as he paused for a breathing space, waved his hand approvingly to the aviator, who was watching him from above. The aeroplanes were only five or six hundred feet up, and it was their duty to warn the French batteries behind as to the progress made, so that the men should not suffer from the fire of their own guns. The progress of each unit was announced to the aviator above by signals. The kite balloons, watching the battle from the rear, were often at a loss as to the position of the advancing lines, but the airmen never made a mistake. To the inexpressible joy of the infantry, the French shells fell exactly where they were needed, just ahead of their lines, and moved steadily forward with their progress. And, though the aeroplanes received plenty of bullets and shrapnel in their planes, not a single one was brought down.

". . . . . With heavy artillery the problem of giving eyes to the gunners, who are miles and miles in the rear, becomes increasingly difficult. The Germans first sought the solution in the kite balloon, or sausage, which was a valuable supplement to the aeroplane. At first they had practically a monopoly of the kite balloons, but now the tables are turned. The Allied aeroplanes were able to work havoc among the kite balloons, and on the Somme front yesterday one could see 20 French kite balloons and not one single German. Despite all efforts the enemy has been able to demolish only one French balloon, and that by an unsportsmanlike device which smacks of sailing under false colours. A German aeroplane, disguised as a French machine, with tricolour discs painted under its wings, succeeded in slipping through the French air patrols and destroying a captive balloon with explosive bullets.

"The French have in this district complete mastery of the air, and, consequently, the German guns are blinded. If the enemy dares to run up a kite balloon, it takes all its force of aeroplanes to protect it. One of the great difficulties in the battle of Champagne was that of informing the artillery of the progress made by the infantry. This problem has been most satisfactorily solved by the 'infantry aeroplanes.' . . . .

"The Germans had evidently realised that their defences on the Somme might prove unequal to resisting the pressure of the French. On June 25th, at the very beginning of the artillery preparation, which only reached its height on the last three days of the month, they evacuated all the civilians in the threatened district. Apparently very short notice was given, but the peasants should not have been unprepared, since thousands of proclamations had been dropped by French aeroplanes among the villages announcing that the Allies armies were coming.

"After the first day's attack the enemy discovered that his worst fears as to the French offensive had been fulfilled, and that there was no chance of serious resistance on his first and second positions. He immediately withdrew, so far as was possible, all his advanced batteries not absolutely indispensable for the continuation of the struggle, to save them from the hands of the advancing French. . . . They have had to continue the struggle in the open, and take their chance of being discovered by a French aviator and being destroyed by the French batteries."

In the course of an interesting description in the *Vossische Zeitung* of the Allies' tactics in their present offensive, Lieutenant Alfred Dambitsch, who was wounded in the recent fighting on the Somme, writes:—

"The plan of destruction of the German front (he says) necessitated gaining ascendancy in the air. Large numbers of British and French airmen were massed in the fighting sector. Every day swarms of them directed the range-finding of the artillery. When the incessant fire began, not a second passed but dozens of enemy aeroplanes flew over our trenches. Great squadrons were sent beyond the German lines to reconnoitre the approach and quartering of our troops, and from time to time drop bombs." . . .

"Generally infantry fighting is preceded by the silencing of the enemy's artillery. This principle was on this occasion transferred to the aerial weapon, which materially increased the effectiveness of the bombardment of our artillery, because artillery without observation from an elevation can accomplish nothing, owing to its indirect fire. The enemy has tested new methods by which airmen can set fire to balloons by pistol shot. This plan is now also adopted by us with very good results."

Mr. W. Beach Thomas, writing to the *Daily Mail* from "the Field," on July 11th, says:—

"One can well understand, though the fact was regrettable, that there was some delay in pushing the attack home. How truly it was said by some of our tacticians at Aldershot as many as five years ago that the next war would be largely fought in woods and villages where there was cover from aerial observation. Among the horrors of the wood was the wreck of one of our aeroplanes."

The *Times* correspondent with the Russian Centre Army, in a despatch dated July 11th, says:—

"German airmen, as usual, are dropping shells on the wounded."

Mr. Philip Gibbs, in a despatch from the British Headquarters in France, dated July 15th, says:—

"With thirty-two prisoners they (Dragoon Guards) rode on slowly, still reconnoitring the open country on the skirt of Delville Wood, until they came again under machine-gun fire and drew back. As they did so an aeroplane came overhead, skimming very low, at no more than 300 ft. above ground. The cavalry turned in their saddles to stare at it for a moment or two, believing that it was a hostile machine. But no bullets came their way, and in another moment it stopped over the German infantry concealed in the wheat and fired at them with a machine-gun. Four times it circled and stooped, and fired, creating another panic among the enemy, and then flew off, leaving the cavalry full of admiration for this daring feat."

BRITISH AIR WORK.

THE following third *résumé* of incidents extracted from recent reports of the Royal Flying Corps in France has been received from the Air Board:—

"June 17th.—Capt. A., while flying in the vicinity of Arras, observed six hostile machines in close formation flying west, and, following these, three more. As Capt. A. approached them from underneath the formation broke up, and simultaneously two other of our machines attacked from above. Capt. A. engaged the nearest machine, which immediately turned and dived, whilst a second machine attacked him from above. Disregarding this second machine he turned in pursuit of the first one, and after a considerable amount of manœuvring he got behind its tail and fired into it at thirty yards range. The hostile machine continued to dive almost vertically with its engine still on, and was finally seen to plunge to earth in a field near Achiet le Grand. On his return journey Capt. A. attacked two other machines and forced both to descend, though in each case they appeared to land under control.

"June 23rd.—Three eight-horse wagons were attacked by one of our machines from a height of 900 ft. and were stampeded.

"June 25th.—As twenty-three hostile kite balloons were reported to be up, it was decided to attack them by aeroplanes at four p.m. Fifteen balloons were attacked, of which six were destroyed. Three more were brought down in flames on June 26th.

"June 27th.—Captain B. successfully carried out a special reconnaissance to observe the effect of wire-cutting operations in front of Gommecourt Wood. In carrying out this duty he descended to 500 ft. to obtain the necessary information.

"June 29th.—One of our machines was attacked by three hostile aeroplanes, which suddenly appeared out of a cloud. The pilot was wounded in the back and lost consciousness, but his observer, climbing out of his seat, roused him, and the pilot landed his machine safely in his own aerodrome. The observer made use of his wireless during the descent to summon a doctor.

"July 1.—Important and successful bombing raids against the enemy's lines of communication were carried out during the day. Several trains were hit and many serious fires occasioned. A bombing raid was launched against a hostile headquarters and a suspected ammunition dump, as a result of which a fire was occasioned at the headquarters which burned for several hours. One pilot failed to release his bombs at the first attempt, and although his engine was running badly and he was continuously being attacked by two hostile aeroplanes, the pilot made two more circles over his objective, released the bombs at the third attempt, and recrossed the lines at 2,500 ft. The attack was repeated later in the day; one bomb fell on the railway, cutting it completely, whilst another destroyed a house. The railways were bombed in many places, several stations are known to have been hit, and in one case a train was hit in the middle and set on fire; this is confirmed by another pilot, who, seeing a train on fire, descended to a low altitude and dropped two more bombs on the rear of the burning train.

"In the early morning hostile attempts at offensive action were attempted by the enemy on our side of the lines, but subsequently this was confined entirely to their side of the lines. No fewer than thirty-five aerial combats took place, in which five hostile machines were brought down on the enemy side of the line, and at least five others were driven down, of which two were seen to be damaged. Another enemy machine was brought down by anti-aircraft fire.

"In one of these combats Major C. single-handed attacked four of the hostile aeroplanes, and it is reported by the anti-aircraft guns that before doing this he completely broke up the German formation of ten aeroplanes and scattered it in all directions. The first machine he attacked was hit between the pilot and the observer and returned to its aerodrome; the second was hit and managed to land in its own lines under control; whilst attacking the third Major C. was hit in the leg, but continued firing until within ten yards. At that range he saw the enemy observer was firing wildly and had evidently been hit. In spite of his wound Major C. proceeded to chase the fourth machine, but was forced to break off the fight owing to his ammunition running out.

"July 2.—There were eleven combats in the air, in which four hostile machines were brought down.

"July 3rd.—The activity of the enemy in the air increased to a very great degree, but it was confined to localities well behind his own lines. Our machines working near the lines were subjected to continuous anti-aircraft fire. There were thirty combats in the air.

"One of our reconnoitring patrols was followed by two Fokkers and a biplane; our escorting machines, having accompanied the reconnaissance back to our lines, turned to engage the enemy, who had by this time been joined by two more Fokkers. One Fokker was shot down and seen to fall to earth, whilst the biplane was forced to descend. Another of our aeroplanes encountered five hostile machines; four were driven off with but little trouble, and though the fifth engaged in combat it was, however, last seen diving vertically with its engine full on, and is believed to have been destroyed."

The following incidents are extracted from recent reports relating to the Royal Naval Air Service.

"Flanders.—June 3rd.—A German battery opened fire on a kite balloon just as it was about to ascend, the first shell bursting within fifteen yards of the basket containing the observers. The cable was immediately cut and the balloon dragged by the crew at the double for three-quarters of a mile, shells following them all the way. The kite balloon was not seriously damaged.

"June 18th.—A seaplane was forced to descend, owing to the engine catching fire, into the middle of an enemy mine-field. A hostile aeroplane and two seaplanes attacked it with machine guns, but were driven off by our fire. Our seaplane was uninjured, and ultimately drifted on the tide towards Nieuport, where the crew were safely rescued.

"Eastern Mediterranean.—May 2nd.—A hostile aeroplane appeared over Mudros, and was driven off by anti-aircraft guns. Within six minutes of its appearance over Mudros our machines from Imbros were in the air with the object of intercepting the enemy's retreat. A seaplane 'spotting' for a monitor resulted in three direct hits being obtained on a railway bridge at Aga Suluk."

Personals

Under the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Second Lieutenant Frederick Cooper Arnaud, Northumberland Fusiliers, killed on July 1st, in his 20th year, was the youngest son of Mr. and Mrs. Arnaud, Fritzoe, Holwood Road, Bromley, Kent. He was educated at Quernmore School, Bromley, and Merchant Taylors' School, and on leaving joined the staff of Messrs. T. Cook and Son. He joined the Royal Flying Corps as a mechanic in May, 1915, proceeding to the front a month later as a despatch rider. After being recommended for a commission he trained at General Headquarters, and in February this year was gazetted, and soon afterwards attached to a trench mortar battery.

Lieutenant Geoffrey F. Briggs, Gloucestershire Regiment, killed on July 12th, aged 19, was the youngest son of the late Mr. and Mrs. William Briggs, of Bristol, and a brother of Squadron-Commander E. F. Briggs, who was shot down in the raid on the Zeppelin factory at Fredrichshafen in November, 1914, and has since been interned in Bavaria. Lieutenant Briggs was educated at Braidlea, Stoke Bishop, and at Clifton College. In February of last year he was given his commission, and he had been promoted Lieutenant (Temporary) quite recently.

Second Lieutenant Geoffrey Ellis Chancellor, the Queen's, attached R.F.C. (killed in action on July 9th), was the son of the late Mr. Walter Chancellor, of Hersham, Surrey, and Mrs. Chancellor, of The Manor House, Marylebone Road, London. Born in 1897, he was educated at Eton, and insisted on leaving school at seventeen, obtaining his commission before he was eighteen years old. His chivalry and fearlessness endeared him to his brother officers in the Flying Corps.

Second Lieutenant Andrew John Tuke Cruickshank, R.G.A., attached R.F.C., who died on July 7th from wounds received in an air reconnaissance on the same day, was born in 1897, and was the youngest son of Mr. G. E. Cruickshank, of Lincoln's Inn, and Mrs. G. E. Cruickshank, 6, Blakesley Avenue, Ealing. He was educated at Mr. Stott's, Seabrook Lodge, Hythe, and at Marlborough, where he was in Field House. From Marlborough he passed into Woolwich in December, 1914, and while there was promoted to the rank of corporal. He received his commission in July, 1915, and left for the front about six weeks ago. He was an Observer in an aeroplane which was attacked by three German machines. Early in the fight he received a wound which made him unconscious, and it was only by great skill on the part of the pilot that the aeroplane was brought back to our lines. An elder brother, Second Lieutenant Donald Edward Cruickshank, who was born in November, 1887, was in the front line of the attack on Sanna-i-Yat on April 9th, and has not been heard of since.

Major George John Malcolm, Royal Artillery, attached R.F.C., killed in action, was 25 years of age, and the only son of Mr. George Malcolm, Sokoto, Northern Nigeria, and of Mrs. Malcolm, of Perham Road, West Kensington, and grandson of the late General Sir George Malcolm. He was educated at Dean Close School, Cheltenham, and obtained the Diploma of the College and the B.Sc. University of London, 1911. From the Officers Training Corps he passed out of Woolwich into the Royal Field Artillery in December, 1911, and in June, 1914, he was appointed to the Royal Flying Corps. He was mentioned in despatches by Viscount French on February 18th, 1915, was promoted Captain in the following June, and became a Squadron-Commander with the rank of Temporary Major in March of this year.

Flight Sub-Lieutenant Victor Nicholson, R.N., killed on July 10th, was the youngest son of the late Mr. W. S. Nicholson, of Eastmore, Isle of Wight, and of Mrs. Nicholson of Grove House, Yarmouth, Isle of Wight.

Second Lieutenant James H. Parkinson, Lincolnshire Regiment, killed in action, was 30 years of age, and was the son of Mr. and Mrs. Walter H. Parkinson. He joined the Royal Flying Corps after the outbreak of war, and in January last received his commission in the Lincolnshire Regiment. Lieutenant Parkinson was educated at St. Cyprian's School, Eastbourne, and Dulwich College. Going to Ceylon he became superintendent of the Koravantavalan Estate, Travancore, India, in the employ of Messrs. Harrison and Crosfield (Ltd.).

Second Lieutenant J. C. M. Stewart, R.F.C., eldest son of Dr. and Mrs. J. Stewart, Lovell House, Leeds, served his apprenticeship with Messrs. J. and J. McLaren, engineers, Leeds, and was afterwards engaged on experimental work in the laboratory of the Wolseley Tool and Motor Car Co. (Ltd.). A director of Noel Paton (Ltd.), he was forming at the outbreak of war a company for the development of his invention of a four-speed chain gearbox for motor cycles. Lieutenant Stewart joined the Leeds "Pals" Battalion, and in March, 1915, obtained a commission in the Leeds Rifles. He was transferred to the Royal Flying Corps, and became a qualified Observer. On returning from a bombing expedition over the German lines, a chance long-distance shell destroyed the machine when about to land and killed the occupants.

Second Lieutenant Ralph Cyril Stoddard, R.F.C., attached South Lancs. Regiment, who was previously reported missing, is now reported to have been killed on July 3rd in combat with two hostile machines. He was the only son of the Headmaster of the Heanor Secondary School, Derbyshire, and was 21 years old. Before receiving his commission in October, 1914, he was training for the law, serving his articles with Messrs. Wilson and Sons, solicitors, Alfreton. He passed the Intermediate Law Examination at the early age of 16½. His Squadron-Commander writes:—"He was engaged with two hostile machines over the enemy lines, and was seen by another machine, which went to his assistance, to fall from several thousand feet in a spinning nose-dive. His machine lies in the enemy's lines, and is so crumpled that none thinks there can be any hope of either him or his Observer being alive. I cannot tell you how great a loss he is to the squadron. He was exceedingly keen and as brave as a lion. Only two days ago he kept on worrying me to let him go bombing, and eventually I let him take a load of bombs to drop on hostile batteries which were worrying our infantry."

Second Lieutenant Godfrey Wiglesworth, R.F.C., who was killed at the front in a flying accident on July 8th, aged 21, was the only son of Dr. and Mrs. Wiglesworth, of Winscombe, Somerset, formerly of Rainhill, Lancashire. He was educated at The Leas, Hoylake, at Clifton, and at King's College, Cambridge, where he was pursuing medical studies at the outbreak of war. He was a member of the Cambridge University O.T.C., and received his commission in the Royal Flying Corps last December, but had only recently gone to the front.

Married and to be Married.

An engagement is announced between Mr. Christopher Llewellyn Bullock, Indian Civil Service, the Rifle Brigade (Special Reserve), and R.F.C., grandson of the late Rev. W. T. Bullock, of Faulkbourne Hall, Essex, and Mr. E. R. Spearman, C.M.G., and Lady Maria Spearman, and Barbara May, second daughter of Mr. Henry Lupton, of Torquay.

Captain Henry Hamilton Kitchener, Royal Engineers, attached R.F.C., was last week married in London to Miss Esther Bluck. Captain Kitchener was younger nephew of the late Earl Kitchener, and son of the late Lieutenant-General Sir Walter Kitchener. Before his death Sir Walter Kitchener was Governor of Bermuda, and the wedding of his son is an outcome of that appointment, as the bride belongs to Bermuda. He stands in remainder to the later titles conferred upon Lord Kitchener, who left him a legacy of £20,000, as well as the reversion to Broome Park in the event of Viscount Broome having no children.

The engagement is announced of Donna Ortensia Nunziante di Mignano, younger daughter of the late Duca di Mignano, of the Castello di Mignano, Provincia di Caserta, Italy, and of the Duchessa di Mignano, and Mr. Charles Francis Piercy, R.F.A., attached R.F.C., only son of Mr. Robert Charles Piercy, of Marchwiel Hall, Wrexham, and of the Contessa Alliata Vaglienti Campiglia di Biserno.

Items.

The will of Second Lieutenant William Norman Thomas, R.F.C., of Oswestry, contractor, who was killed in France, April 8th, has been proved at £2,832.

AIRCRAFT FOR NAVAL WORK.

In a speech at Brockenhurst on Saturday in support of a resolution of congratulation to the Admiralty and the officers and men of the Fleet on the Jutland battle, Lord Montagu of Beaulieu made several points in connection with the use of aircraft in connection with naval work. He said that the results of the battle were not all that could be wished, because they desired complete, final, and overwhelming victory, which might possibly have been achieved if we had possessed more aircraft. Since the battle he had talked with many naval men who believed in aircraft, and all admitted, and many were enthusiastically certain, that if we had had rigid airships as eyes to the Fleet, the German fleet would never have been able to retreat as it did at the moment that it did. It had been assumed that Zeppelins would be of no great value in a naval battle. During this battle he had ascertained that five Zeppelins had been reported by our Fleet in 24 hours. We had no air scouts at all, and only one seaplane, operating on our side, though that was of great value.

The lack of airships to assist the Fleet was due not only, as some people thought, to Mr. Winston Churchill, who, no doubt, during the last few months of his *regime* at the Admiralty did nothing to assist, but to a long period before, in which the value of airships to the Navy was largely discounted, and the whole question of aircraft was "crabbed." There was no settled policy for a long time. Orders to build airships were cancelled almost before the sheds in which to build them had been erected, but he thought it fair to say that Mr. Churchill had had the candour and courage to admit that he was wrong.

In his opinion, in the future more than half of the work of the Navy would be done in the air. There was no doubt that an airship was the equal of at least three cruisers from a scouting point of view, and even more destroyers. At 10,000 ft., providing visibility was good, a Zeppelin could see 80 or 90 miles, while the range from the foremast of a cruiser would probably not exceed 12 or 15. He thought the Naval Air Service was going to be the most absolutely necessary part of the senior service. He should like every Commander-in-Chief of a big fleet to have on the bridge a senior flying officer who could use aircraft to the best advantage. He was certain it would be cheaper, from the point of view of losses in material and personnel, and more efficient for aircraft to do most of the scouting, providing it was not heavy weather, than for the work to be done by cruisers and destroyers, and he hoped to see that view universally adopted. Sir John Jellicoe, he added, was most desirous of having more aircraft.

Speaking of the work of the Royal Flying Corps in the recent advance, Lord Montagu said the pilots were splendid and courageous officers, and their skill and courage combined had brought most fruitful results to our arms. Those who criticised the department as he had done were no more criticising the pilots than one would criticise the gallant crew of an unseaworthy ship. The machines at the front were very much better than they were three months ago, and the result had been that we had nearly swept the sky bare of the much-advertised Fokker. As time went on, that improvement would not only be maintained but accelerated. In a few months from now the comparative supremacy which we had regained would be firmly established. The longer the war went on, the more would the excellence of our machines, coupled with the gallantry of our pilots, establish our Air Service as superior to any other.

* * *

Neck-wear for Air Work.

To those who take a pride in their personal appearance, but find difficulty when working about an aeroplane to keep their collar clean, Linaline collars come as a veritable godsend. They are not to be confounded with rubber or celluloid collars, for they are ordinary good class cotton goods, but impregnated with a special substance which enables any dirt which may get on them to be washed off with plain soap and water. To all appearance they are linen collars fresh from the laundry, and all that is necessary to keep them so is an occasional visit to the tap or a rub with a damp cloth, and then dry with the towel. They are perfectly waterproof, and consequently rain has no effect on them. They can be obtained from most hosiers, &c., but you should see that you do get "Linaline" collars.

For Three-Ply Birch and Ash.

Those firms who have been experiencing considerable difficulty in obtaining supplies of three-ply ash or birch boards for wing ribs and other purposes will be interested to hear that Messrs. Brown Brothers of Great Eastern Street, E.C., have made arrangements whereby they can guarantee prompt delivery. The thicknesses vary from $\frac{3}{32}$ in. to $\frac{1}{4}$ in., and the size of the boards from 6 ft. by 2 ft. to 6 ft. by 2 ft. 6 ins. All boards are A.I.D. passed, and also to R.A.F. specifications (61A and 83). Samples will be supplied on application.

Learning to Fly.

In their latest book Messrs. Claude Grahame-White and Harry Harper have collaborated to produce what they describe as a "manual for beginners." They have assumed that it will go into the hands of those who know very little of aviation but who want to get an idea of the actual business of learning to fly. They have accomplished their task admirably, and we can hardly imagine that anyone who purchases the book will grudge the expense. It describes in simple language the various stages of a pupil's tuition, and by means of the photographs, which have been specially taken at Hendon, there should be no difficulty in following the description of how the various controls are manipulated. There are other chapters in the book which the prospective pupil would do well to thoroughly digest, such as "Temperament and the Airman," "Factors that make for Safety," "Perils of the Air." "A study of the methods of great pilots," &c. The book is published by T. Werner Laurie, and can be obtained from "Flight" office for 2*s.* 10*d.* post free.

"Heat Treatment of Steel."

Although it is not very bulky, the book bearing the above title, which has just been issued by Messrs. G. P. Wall, of Magneto Works, Sheffield, will be found of very great value by aeroplane manufacturers. Not only does it contain a wealth of information on the treatment of steel, with a tempering chart, in colour, but there is a very comprehensive series of tables of gauge comparisons, metric equivalents, and other data. In fact, we do not think there is any other handy publication which contains such complete data relating to steel. Since the inception of the aeroplane industry, the firm have specialised in steel and steel wire to meet the requirements of aircraft work, and so are in a position to render valuable assistance to aeroplane manufacturers. Messrs. G. P. Wall will be pleased to send a copy of the book, which is bound in cloth, to any aeroplane manufacturer, who applies for one.

* * *

PUBLICATIONS RECEIVED.

Trade as a Science. By Ernest J. P. Benn. London: Jarrold and Sons. Price 2*s.* 6*d.* net.

Badges and Their Meaning. London: George Philip and Son, Ltd., 32, Fleet Street. Price 1*s.* net.

Heat Treatment of Steel, Gauge Comparisons, Metric Equivalents, &c. By G. P. Wall, Steel and Wire Manufacturers, Magneto Works, Sheffield.

National Physical Laboratory Report for the Year 1915–16. Teddington: The National Physical Laboratory.

* * *

NEW COMPANIES REGISTERED.

Aerolite Piston Co., Ltd., Hanover Court Garage, Hanover Street, W.—Capital £500, in £1 shares. Under agreement with Bentley and Bentley, Ltd., for the acquisition of the business of manufacturers and sellers of aluminium pistons and castings for use in connection with aeroplane and other internal-combustion engines, &c. A. H. M. J. Ward signs as "Director."

Robinhood Engineering Works, Ltd., Newlands, Putney Vale, Surrey.—Capital £10,000, in £1 shares. Manufacturers of and dealers in sparking plugs and other ignition apparatus for use in internal-combustion engines, general engineers, &c. Under agreement with K. E. L. Guinness.

* * *

Aeronautical Patents Published.

Applied for in 1915.

Published July 13th, 1916.

12,443. W. M. Webber. Airships.

Published July 20th, 1916.

17,556. G. Giem. Safety appliance for flying machines.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice,

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

SOMETHING more than a puff of air, most of the world knows, is required to disturb the Briton out of his regular groove of either action or thought, but when the force of circumstances is so great that the slow-moving mind of the million at last grasps the necessity for getting a move on, it must be a pretty powerful opposing force which can hope to stem successfully the effect of the reaction, once set in motion. That the vast majority of the people have long since fully awakened to the vital necessity of uninterrupted and unlimited supplies of "munitions"—using the word in its broadest sense—is manifest in every direction. On the other hand, there appears still to be a small section of the community which has hardly yet heard that our kith and kin have been and are having a pretty hefty—not to say rotten—time of it out yonder, in touch with the enemy's trenches, and that if anything the condition of affairs is likely to be a good deal more trying, before it gets better, thus leading us and our Allies to that victory which is so necessary to ensure life to the cause of the world's civilisation, a victory which our new War Minister already sees looming ahead "in a few months." No doubt this term is not meant literally, and if it should materialise in a year it should be near enough to command ungrudingly whatever supreme effort is necessary amongst the home war-workers to do their part in the great upheaval. Yet from the necessity for the piling up recently of appeal upon appeal to the war-workers not to relax their efforts and to forego for still another period all idea of a general holiday, it is evident that there still must exist a number of people who have positively no conception of the sense of proportion in the National death-struggle which is being enacted over hundreds of miles of frontage, starting from within a few miles of the shores of this country. It is horribly humiliating to our national character that it should be necessary to couch these appeals in language that savours at times almost of cringing. That it should be necessary to claim that every man should do his duty at the present crisis, in such solicitous terms of argument as have been used, would suggest that in the directions where appeal of such a character is necessary, that degeneracy of the British Nation,

Is Duty Self-Denial?

upon which the Huns counted so much in their mistaken calculations for the course of the war, had really set in and had begun to take a hold upon our national vitals. In which case, whatever the horrors of this ghastly struggle have in store for us and the world, it is something to be thankful for that our degeneracy canker has been taken in time. To this extent Britain will have, after all, to give thanks to the Huns. That the dire necessities of the position have touched the souls even of the most ignorant and selfish is plain from the more immediately favourable response of practically every individual worker to the most recent call to keep the munition factories running without interruption. What, however, we deplore is the almost degrading methods which it has been deemed advisable to adopt in drumming home the requirements of the Empire. That Sir Douglas Haig's personality should have to be brought into direct contact with the munition worker—be the slacker ever so greatly in the minority—on behalf of our Army in France, "to enable it to complete its task," and that he, Sir Douglas, should feel that "this appeal will not be in vain," is a form of abasement for a distinguished man which one would have deemed almost impossible in a nation which has risen, as a whole, so magnificently to its sense of duty to our Empire and the civilised world. The leaders of the men have done—and done well—all that was required of them in guiding their organisations into the correct and only possible decision in this the latest phase of the holiday question, and it is to be hoped, that now the general offensive of the Allies has made its start, there will be no further occasion to call upon those this side not to jeopardise the gathering of the fruits of all our past efforts for the sake of a temporary indulgence in what would be just now the dangerous, although admittedly well-earned, luxury of a rest. It is now no longer a case of self-denial, it is clearly a case of sheer necessity and duty.

* * *

à Berlin. Unsuccessful as he was in completing his task, Sub-Lieutenant Pierre Marchal, of the French Air Service, will go down to history in this war as the man who demonstrated "à Berlin" by way of the air, not only a possibility, but made it an accomplished fact. That no hostile object was intended in this remarkable adventure, renders the feat all the more creditable, as, from the leaflet messages which were distributed over Germany's capital by the pilot, the real object of the hazardous journey was revealed, and every credit is due to the French Command which sanctioned the flight and to the intrepid pilot who undertook the delivery of "the goods." That the German public have been saturated with official German statements of the will and intention of the French and British air services to bomb non-military residents in unfortified cities whenever they got the chance there is little doubt. By this means it has been sought—and successfully to an extent—to justify the abominations perpetrated under the air command of the Huns. By the action of Lieutenant Marchal it has now been made perfectly clear to the German nation that, except by way of drastic reprisal, the Allies have no intention or desire to harm non-combatants if it can be avoided, and the message dropped to the effect that "We might have bombarded the open city of Berlin and so killed innocent women and children, but we are satisfied with dropping this proclamation," should help them to realise the dastardly work of their own air-pirates in its true light. That it could have been proved possible for a pilot to traverse so great a distance as 840 miles across country under ordinary touring or competition conditions would, in itself, constitute an outstanding world's record. To have accomplished so remarkable a journey under the existing conditions of Europe and to have missed the intended goal in Russia by a matter of only about 60 miles, brings the achievement into the realms of the marvellous. It is well noted the time when Lieutenant Marchal left Nancy on June 20th, and it is no doubt equally well authenticated at what hour on June 21st he landed near Cholm in Poland. We shall hope that steps may presently be taken to "homologue" this cross-country trip as a world's record. After all, whatever horrors may arise between nations in allaying the passions of men who seek to transform the nations of this earth, sport is still a world of its own, and one which will ever command the admiration and respect of every section of the world's inhabitants. Even if the Huns fail to recognise anything praiseworthy in this novel method of administering an antidote to their "Kultur," France, Great Britain and the rest of the civilised nations will, we feel sure, be only too ready to accept this unique "record," and in good time do homage to its holder.

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The Army Council.

In the *London Gazette* of the 21st it was announced that the King had been pleased by Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date the 7th inst., to appoint: The Right Hon. Lloyd George, President; The Right Hon. the Earl of Derby, K.G., G.C.V.O., C.B., Vice-President; General Sir W. R. Robertson, K.C.B., K.C.V.O., D.S.O., Lieutenant-General Sir J. S. Cowans, K.C.B., M.V.O., Lieutenant-General Sir C. F. N. Macready, K.C.B., K.C.M.G., Major-General (Temporary Lieutenant-General) Sir D. Henderson, K.C.B., D.S.O., Major-General Sir S. B. von Donop, K.C.B., Major-General R. D. Whigham, C.B., D.S.O., and Mr. H. W. Forster, to be His Majesty's Army Council.

Gallantry in Saving Life.

In the list of monthly awards of the Royal Humane Society appear the following:—

Bronze medal to Second Lieutenant A. W. Keen, Royal Flying Corps, for his rescue of Lieutenant MacBeth from the sea near Montrose on June 17th. The aeroplane on which Lieutenant MacBeth was flying came down in the sea, and Lieutenant Keen, who was also flying, seeing the accident, at once landed, and, making his way to the place, was just in time to save Lieutenant MacBeth, who was trying to swim ashore from the wrecked machine.

Medal to Second Lieutenant Sydney Smith, also of the Royal Flying Corps, for his rescue of a man of the R.G.A. from the harbour at Portsmouth on June 3rd.

Naval Aircraft and Preparation for War.

In his article in the *Sunday Pictorial* of July 23rd, detailing the happenings which preceded the outbreak of war, Mr. Winston Churchill, who was at the time First Lord of the Admiralty, fixes the date of July 27th, 1914, when all naval aircraft was moved to vulnerable points on the East Coast.

Sweden and Neutrality in the Air.

A provisional order has been published in Stockholm prohibiting foreign aircraft from passing over Swedish territory without the special permission of the Swedish Government. The decree comes into force immediately.

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of July 18th :—

Lieutenant (Temporary R.N.V.R.) L. H. Cockey, entered as Probationary Flight Sub-Lieut. (Temporary), seniority July 23rd, and appointed to " President " for R.N.A.S.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of July 18th :—

Flight Commanders (from Flying Officers, and to be Temporary Captains whilst so employed).—Lieut. C. H. Nicholas, S. Wales Bord.; June 16th, 1916. Temporary Second Lieut. E. J. Tyson, General List; June 23rd, 1916. Second Lieut. R. W. Nichol, Special Reserve; July 3rd, 1916.

Flying Officers.—June 22nd, 1916: Capt. I. A. E. Edwards, R.A., and to be seconded; Lieut. W. A. Skeate, W. York. R., and to be seconded; Temporary Second Lieut. L. S. Weedon, R. Fus., and to be transferred to the General List; Second Lieut. P. Pralle, Special Reserve, June 25th, 1916. June 26th, 1916: Temporary Second Lieut. C. H. Stocks, Sco. Rif., and to be transferred to the General List; Second Lieut. F. McQuistan, Highland Brig., R.F.A., T.F.; Temporary Second Lieut. G. J. King, General List, from Asst. Equipment Officer; Second Lieut. G. P. Alexander, Special Reserve. June 27th, 1916: Temporary Second Lieut. E. R. Manning, from Temporary Lieutenant, 14th Res. Regt. of Cav., and to be transferred to the General List; Temporary Second Lieut. C. J. W. Crichton, York. R., and to be transferred to the General List; Second Lieut. H. W. Pollak, South Midland (Howitzer) Brig., R.F.A. (T.F.); Temporary Second Lieut. W. H. Rilett, Essex R., and to be transferred to the General List; Second Lieut. E. G. Whelon, R. Suss. R. (T.F.); Second Lieut. H. C. G. Watney, Special Reserve. June 28th, 1916: Second Lieut. H. W. Tagent, R. Ir. Fus., and to be seconded; Second Lieut. E. Newling, A.S.C., and to be seconded; Capt. J. A. Denistoun, 8th Canadian Inf. Bn., from a Flying Officer (Observer); June 29th, 1916. June 30th, 1916: Temporary Second Lieut. J. A. Slater, R. Suss. R., and to be transferred to the General List; Temporary Second Lieut. B. St. J. Boultbee, E. York. R., and to be transferred to the General List; Temporary Second Lieut. R. W. Scoles, R. W. Kent R., and to be transferred to the General List; Second Lieut. G. A. Lascelles, Special Reserve.

Balloon Officers.—Temporary Second Lieut. T. N. Jennings, York. R., and to be transferred to the General List; June 24th, 1916. June 26th, 1916: Temporary Lieut. J. A. Stevenson, R.A., and to be transferred to the General List; Temporary Second Lieut. C. A. McConchie, Leic. R., and to be transferred to the General List. Temporary Second Lieut. R. P. Romer, General List; July 1st, 1916.

Memoranda.—To be Temporary Second Lieutenants for duty with R.F.C.: Pte. William T. H. Hocking, from Inns of Court O.T.C.; June 19th, 1916. Sergt.-Maj. Archibald Latimer, from R.F.C.; June 24th, 1916. Corpl. Stanley G. Young, from London Electrical Engrs. (T.F.); July 1st, 1916. July 8th, 1916: Pte. Alexander J. Salton, from Inns of Court O.T.C.; Pte. Reginald J. Rankin, from Inns of Court O.T.C.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: H. C. G. Watney, L. M. McCoy, E. C. Callaghan, D. W. Hardy, F. A. Corbett.

To be Second Lieutenants (on probation): George A. Lawlor; June 14th, 1916. Cecil M. W. Park; June 19th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 19th :—

Squadron Commanders (from Flight-Commanders, and to be Temporary Majors, whilst so employed).—Capt. (Temporary Lieutenant in Army) E. W. Powell, Unattached List (T.F.); June 23rd, 1916. Capt. H. Blackburn, Special Reserve; July 5th, 1916.

AT THE SPORTS MEETING OF THE 15TH RESERVE SQUADRON, R.F.C., AT DONCASTER LAST WEEK.—A good start for the quarter-mile. A very successful meeting resulted, quite a number of the events being of the usual amusing character so much appreciated at Gymkhanas.

Flight-Commanders (*from Flying Officers*).—Capt. Sir N. R. A. D. Leslie, 38th Central Ind. Horse, Ind. Army; July 1st, 1916. Lieut. N. A. Browning-Paterson, R.A., and to be Temporary Captain whilst so employed; July 3rd, 1916. Capt. R. N. Adams, R. Fus., Special Reserve; July 8th, 1916.

Flying Officers.—Temporary Second Lieut. M. L. Taylor, General List; June 24, 1916. June 30th, 1916: Capt. Sir N. R. A. D. Leslie, Bt., 38th Central Ind. Horse, Ind. Army. Lieut. F. C. Baker, D. of Corn. L.I., Special Reserve, and to be seconded. Temporary Second Lieut. C. R. Cox, Dorset. R., and to be transferred to General List; July 1st, 1916, Second Lieut. (on probation) W. H. C. Buntine, Notts. and Derby. R., Special Reserve, and to be seconded; July 2nd, 1916. July 3rd, 1916: Capt. A. T. Cull, Sea. Highrs., Special Reserve, and to be seconded; Second Lieut. E. C. Callaghan, Special Reserve; Temporary Second Lieut. N. W. Webb, General List; Second Lieut. D. W. Hardy, Special Reserve.

Assistant Equipment Officers.—July 1st, 1916: Temporary Second Lieut. R. Ferguson, General List; Second Lieut. W. F. Bryant, R.W. Surr. R., and to be seconded.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: S. W. Mann, G. C. Bailey.

To be Second Lieutenants (on probation): Edward G. Herbert; June 19th, 1916. Sydney L. Hollis, Norman L. Knight; July 8th, 1916. Percy A. Barron; July 10th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 20th :—

Memoranda.—Second Class Air Mechanic Francis E. B. Duff, from R.F.C., to be Temporary Second Lieutenant, for duty with R.F.C.; July 6th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: H. M. Corbold, F. L. Hambly, H. M. Fleming.

The following appeared in the *London Gazette* of July 21st :

Flying Officers.—Second Lieut. T. P. L. Molloy, Dorset R., and to be seconded; July 2nd, 1916. July 4th, 1916: Temporary Second Lieut. C. R. Richardson, R.W. Kent. R., and to be transferred to the General List; Second Lieut. B. B. Toms, R. War. R., Special Reserve, and to be seconded; Temporary Second Lieut. H. H. Berry, E. Kent R., and to be transferred to the General List; Second Lieut. D. S. Turnbull, R. Highrs. (T.F.); Second Lieut. H. M. Fleming, Special Reserve; Second Lieut. F. L. Hambly, Special Reserve; Second Lieut. G. C. Bailey, Special Reserve; Temporary Second Lieut. R. M. Drummond, General List; Second Lieut. J. Duncan, Border R., and to be seconded. July 5th, 1916: Lieut. F. H. McNamara, Australian Flying Corps; Lieut. K. W. Brewster, R. Fus., Special Reserve, and to be seconded; Second Lieut. (Temporary Lieutenant) A. S. Redfern, R.W. Surr. R. (T.F.); Second Lieut. L. H. Peter, Cornwall Fortress Engineers, R.E. (T.F.); Second Lieut. (on probation) A. L. Pinkerton, R.F.A., Special Reserve; Temporary Second Lieut. A. W. Bird, E. Surr. R., and to be transferred to General List; Second Lieut. H. M. Corbold, Special Reserve; Second Lieut. S. P. Briggs, North'n R., and to be seconded.

Supplementary to Regular Corps.—Second Lieut. Phillips D. Rader is removed from the Army for absence without leave; June 5th, 1916. Lionel Stones to be Second Lieut. (on probation); June 19th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 22nd :—

Flying Officer.—Temporary Second Lieut. E. Newling, A.S.C., and to be transferred to the General List; June 28th, 1916. (Substituted for the notification in the *Gazette* of July 18th, 1916.)

Balloon Officer.—Second Lieut. (Temporary Lieutenant) J. Y. McLean, R.F.A. (T.F.); July 4th 1916.

Adjutant.—Lieut. (Temporary Captain) T. E. Longridge, A.S.C., and to retain his temporary rank whilst so employed, vice Lieut. (Temporary Captain) B. E. Sutton, Westmorland and Cumberland Yeo. (T.F.); June 23rd, 1916.

The rank of Major I. A. E. Edwards, R.A., is as now described, and not as in the *Gazette* of July 18th, 1916.

Lieut. Robert C. Robb, from R.N.V.R., to be Temporary Second Lieutenant for duty with R.F.C.; July 22nd, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: H. M. B. Law, G. S. Rogers, F. H. Stone, H. D. Crompton, C. A. R. Shum, P. W. Snell, and F. B. Baragar.

James Mitchell to be Second Lieut. (on probation); June 23rd, 1916.

Central Flying School

The following appeared in a supplement to the *London Gazette*, issued on July 24th :—

Commandant.—Capt. (Temp. Lt. Col.) A. C. H. Mac Lean, R. Scots, from a Wing Commander, and to retain his temporary rank whilst so employed, vice Brevet Major C. J. Burke, D.S.O., R. Ir. Regt.; June 18th, 1916.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties :—

Killed.

Flight Sub-Lieutenant Douglas H. Whittier, R.N.

Accidentally Injured (JULY 22nd).

Flight-Lieutenant Kenneth S. Savory, D.S.O., R.N.

The following casualties have been officially announced by the War Office :—

Killed.

Second Lieutenant G. E. Chancellor, Queen's (R.W. Surrey R.), attached R.F.C.
Major G. J. Malcolm, R.F.A., attached R.F.C.
Second Lieutenant G. Wiglesworth, Royal Flying Corps.

Previously reported Missing, now reported Killed.

Second Lieutenant J. C. Cunningham, Royal Flying Corps.

Wounded.

Second Lieutenant E. Birch, E. Lancs. Regt. and R.F.C.
Second Lieutenant C. J. Q. Brand, Royal Flying Corps.
Second Lieutenant T. L. Brennan, Royal Flying Corps,
Lieutenant R. G. Gould, Royal Flying Corps.
Second Lieutenant H. A. V. Hill, Army Service Corps, attached R.F.C.
Lieutenant M. T. Vaughan-Lewes, Welsh Regt., attached R.F.C.
1210 Sergeant D. Chapman, Royal Flying Corps.

Previously reported Missing, now reported Wounded.

Second Lieutenant N. P. Tucker, Indian Army Res. of Off., attached R.F.C.

Missing.

Second Lieutenant H. W. Butterworth, R.F.C.
Lieutenant-Colonel H. C. T. Dowding, R.A., attached R.F.C.
Captain A. J., Evans, Royal Flying Corps.
Second Lieutenant H. Floyd, Royal Flying Corps.
Second Lieutenant J. E. Griffith, Dorset R., attached R.F.C.
Lieutenant H. R. Hele-Shaw, Royal Flying Corps.
Second Lieutenant C. V. Hewson, Royal Flying Corps.
Captain W. W. Jefferd, Middlesex R., attached R.F.C.
Lieutenant E. C. Jowett, General List and R.F.C.
Captain J. U. Kelly, R.F.C., attached Wilts. R.
Lieutenant H. O. Long, Royal Engineers and R.F.C.
Captain T. E. Longridge, A.S.C., attached R.F.C.
Captain J. H. F. McEwen, Cameron High'rs., attached R.F.C.
Second Lieutenant D. H. MacIntyre, Arg. and Suth'd. Highlanders, attached R.F.C.
Captain J. C. Quinnell, R.F.A., attached R.F.C.
Second Lieutenant W. G. Pender, Royal Flying Corps.
Second Lieutenant A. H. T. L. Speer, attached R.F.C.
Captain W. D. Sunday, Royal Flying Corps.
Lieutenant G. Thompson, Royal Flying Corps.
Second Lieutenant W. J. M. Tomson, Royal Flying Corps.
Second Lieutenant W. A. Wedgewood, R.E., att. R.F.C.
Lieutenant J. L. Whitby, Leinster Regt., attached R.F.C.

Previously reported Missing, now reported Wounded and Prisoner of War.

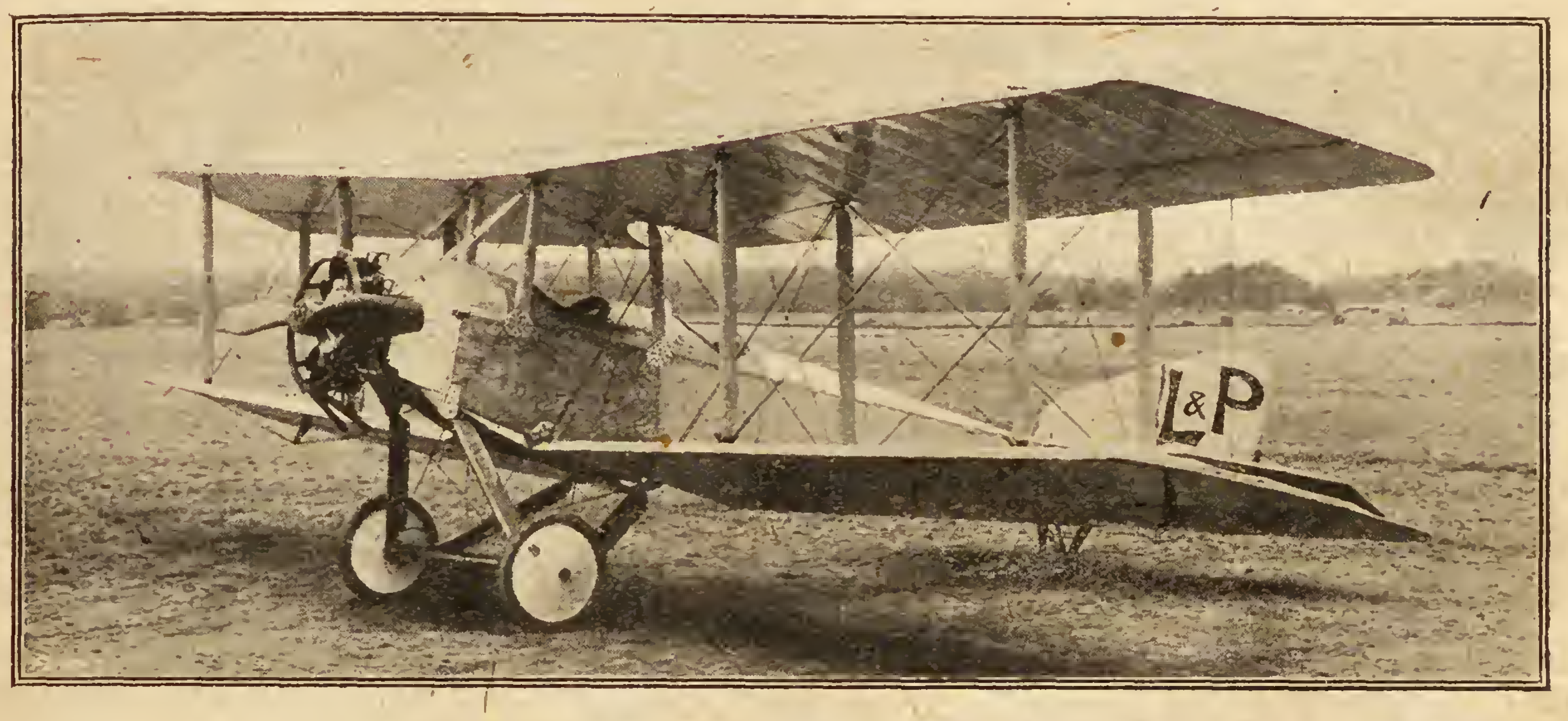
Second Lieutenant G. E. Maxwell, Royal Flying Corps.

Correction: **Wounded.**

Second Lieutenant T. A. Tillard, Yeomanry, attached R.F.C., should read: Lieutenant T. A. Tillard.

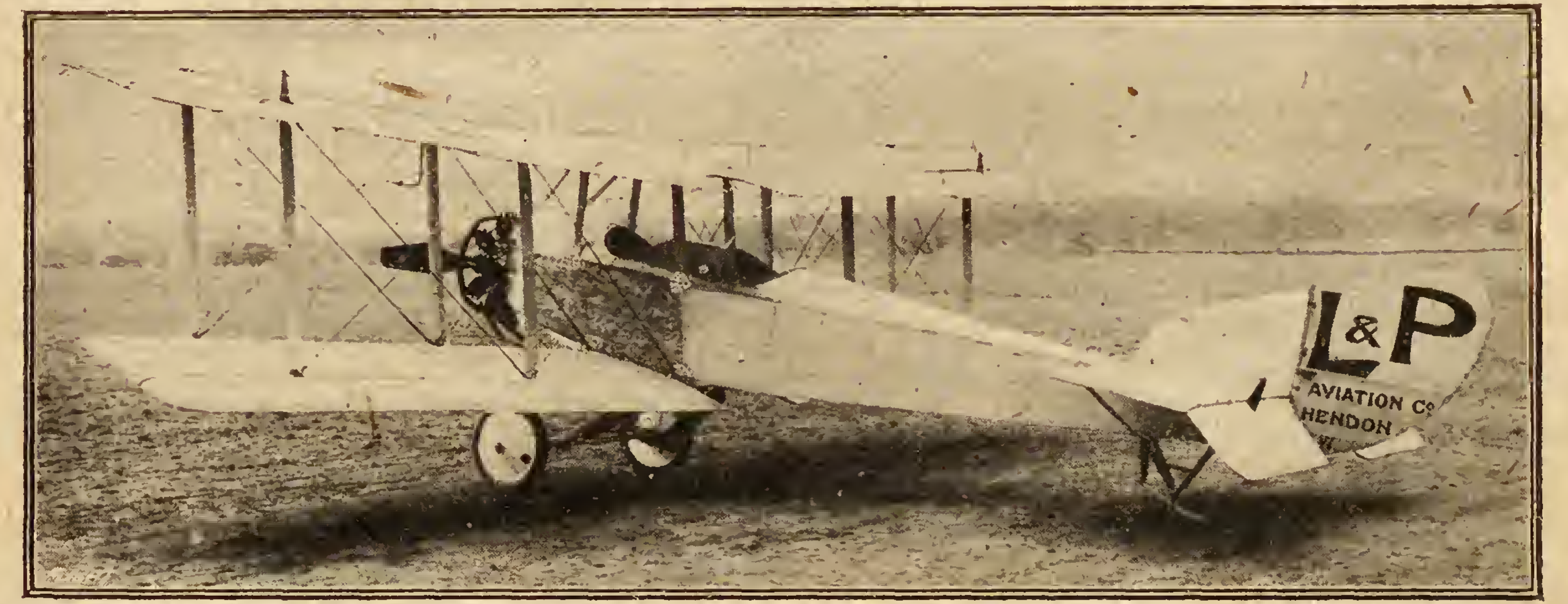
THE NEW L. AND P. *FUSELAGE* BIPLANE.

A VERY neat and clean design. This is the first impression received when viewing the new biplane built by the London and Provincial Aviation Co., of Hendon, and, as in so many other cases, closer acquaintance confirms the first impression. The designer of the machine, Mr. Fletcher, who previous to joining the L. and P. firm was associated with Messrs. Martin and Handasyde of Brooklands, has managed to incorporate into a very graceful outline design a number of cleverly thought out details, and the result is a machine combining everywhere the required, and in many places a greater, factor of safety with a minimum of weight. In this connection it might be pointed out that throughout the machine all fittings are so designed as to avoid piercing any of the important members subjected to stress, such as main wing spars, body rails, &c. It is by this means that it has been possible to cut down weight without sacrificing strength, and so well have the various fittings been thought out that nowhere has the designer had to resort to a clumsy, ungainly job to get around the objectionable drilling.

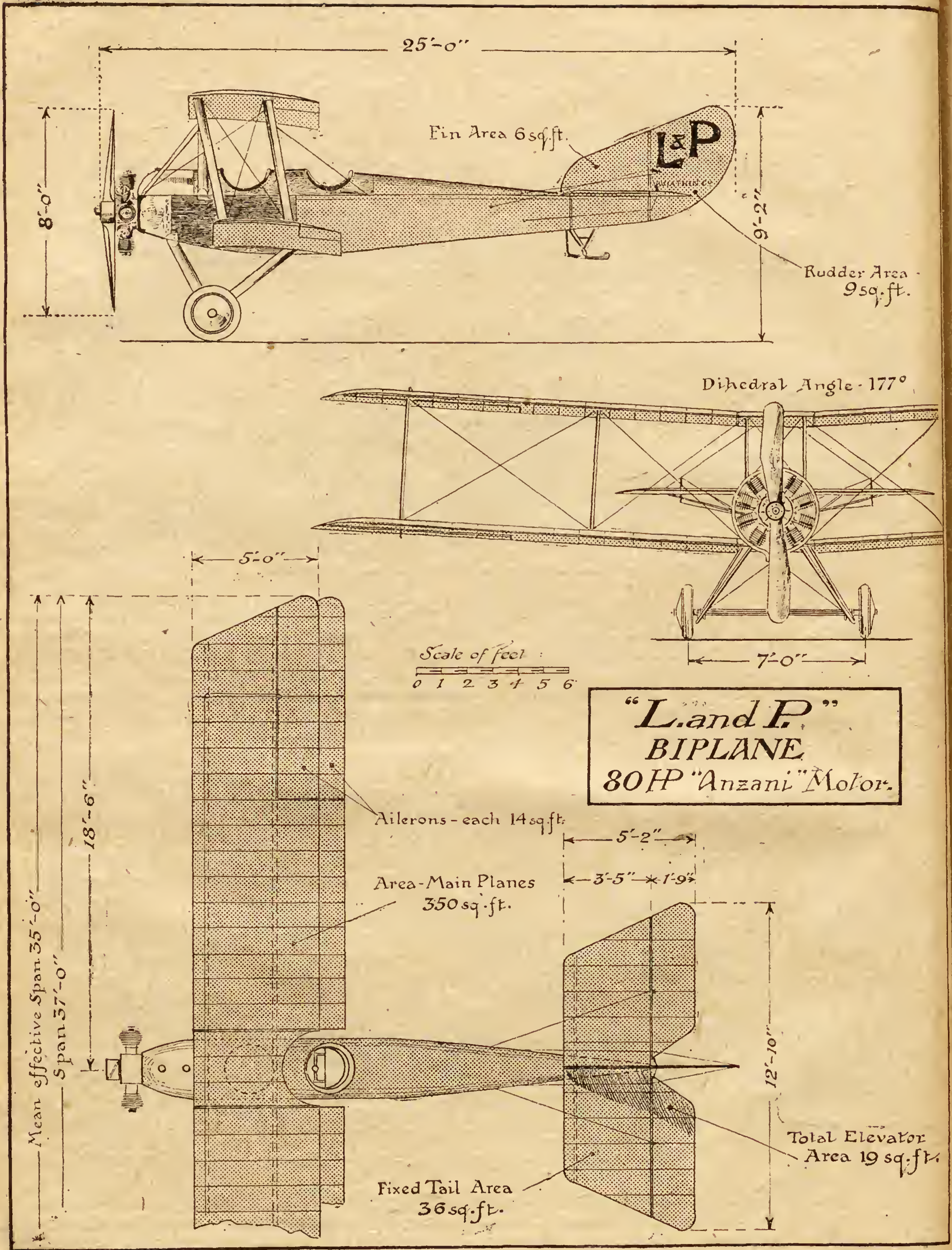


Three-quarter front view of the L. and P. biplane. "Flight" Copyright

From the accompanying photographs and scale drawings a good idea can be formed of the general arrangement of the new L. and P. biplane, while some of the constructional details are shown in the various sketches. The body, which is of rectangular section, is probably of as good a streamline form as it is possible to obtain without the use of formers and stringers. It is built up of ash rails, tapering and spindled out towards the rear, and connected by vertical and horizontal struts. In the rear portion the bracing is effected by wiring, while in front where, as will be seen, the covering consists of three-ply ash bracing takes the form of diagonally placed spruce struts. The wiring plates connecting the struts to the rails in the rear part of the body are some of the most ingenious we have seen, being made up of three pieces of very light gauge, the three pieces being held together by the copper eyelets in the holes for the



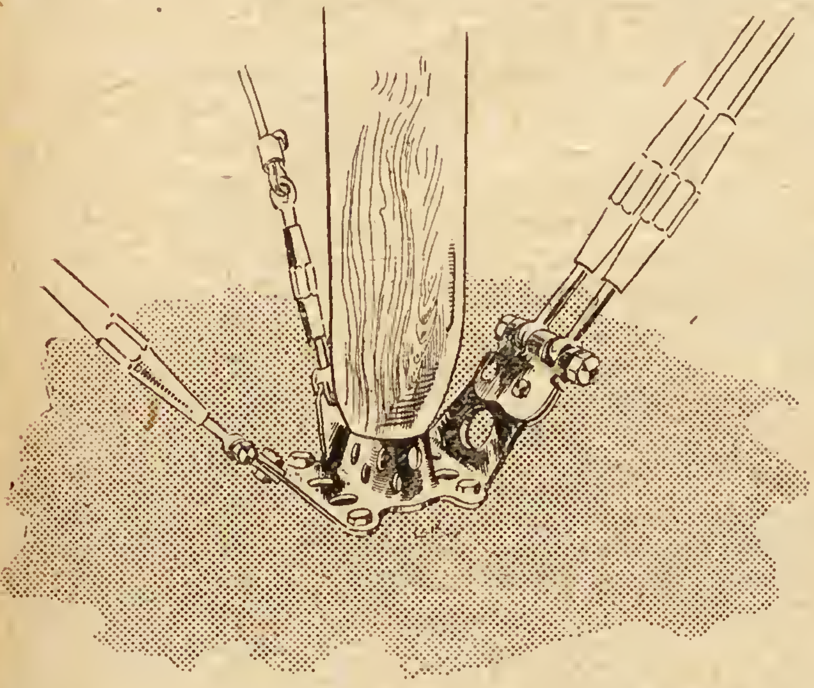
Three-quarter rear view of the L. and P. biplane. "Flight" Copyright.



"Flight" Copyright.

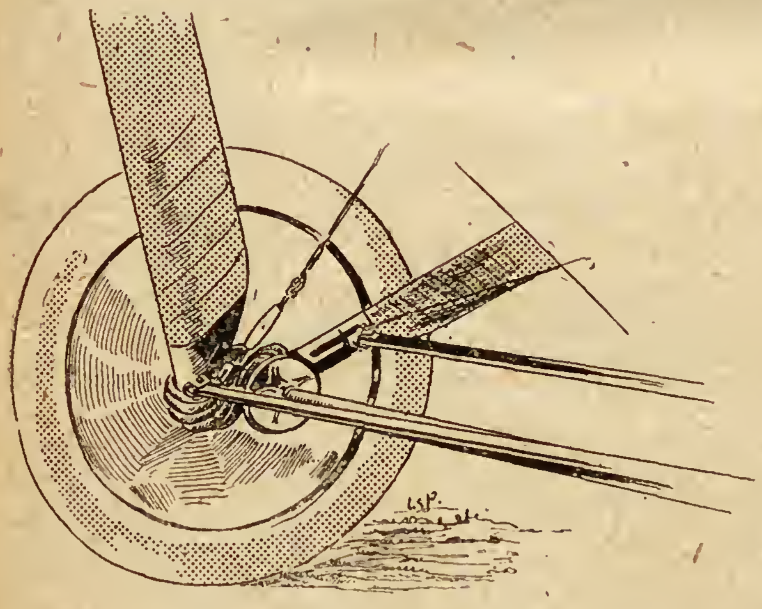
THE NEW L. AND P. *FUSELAGE* BIPLANE.—Plan, front and side elevation to scale.

bracing wires. The fitting is quickly and cheaply made, being, as already mentioned, of very light gauge, and by making it in two standard sizes it can be employed irrespective of the taper of the body rails.



"Flight" Copyright.

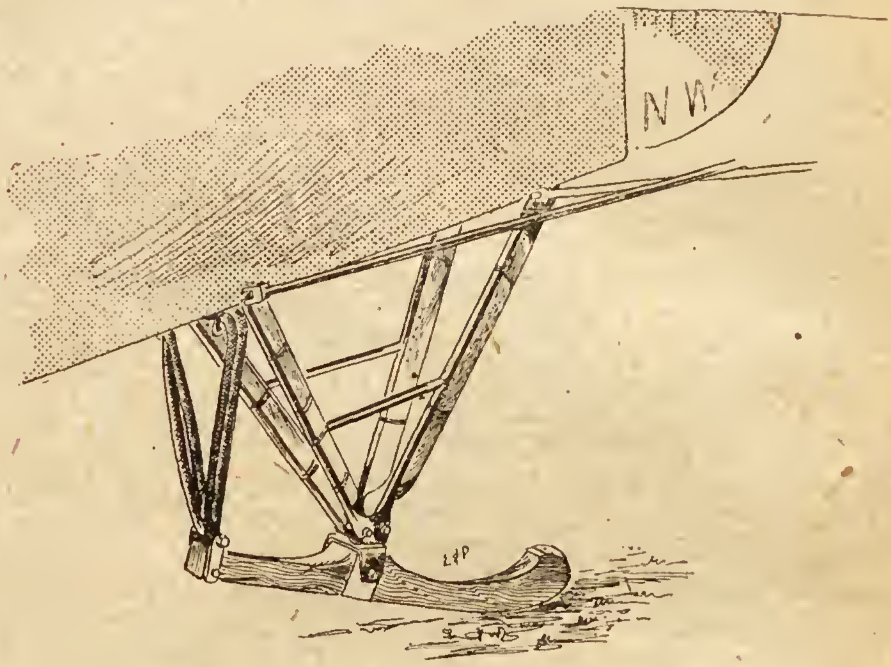
One of the strut sockets of the L. and P. biplane.



"Flight" Copyright.

Details of the chassis of the L. and P. biplane.

In front a number of the metal fittings take the form of large Duralumin plates serving a variety of purposes. Several of these plates can be seen in the illustrations. A turtle back, consisting in front of three-ply wood, and at the rear of formers and stringers, tops the body and helps to give the necessary depth for effectively enclosing the occupants, of whom nothing but the heads are seen when the machine is flying. The pilot occupies the back seat, and has in front of him a neatly fitted dashboard with all the usual instruments, including engine revolution counter, altimeter, air speed indicator, clock, petrol pressure gauge, telltale oil glass, &c. In front of the pilot, and in a separate cockpit, is installed the passenger, whose seat is placed on top of the main petrol tank, which in turn rests on the bottom of the body. From this tank the fuel is forced by means of a pressure pump to a smaller service tank in the nose of the body. The controls consist of a central lever of wood mounted on a longitudinal rocking shaft, and of a foot bar for the rudder.

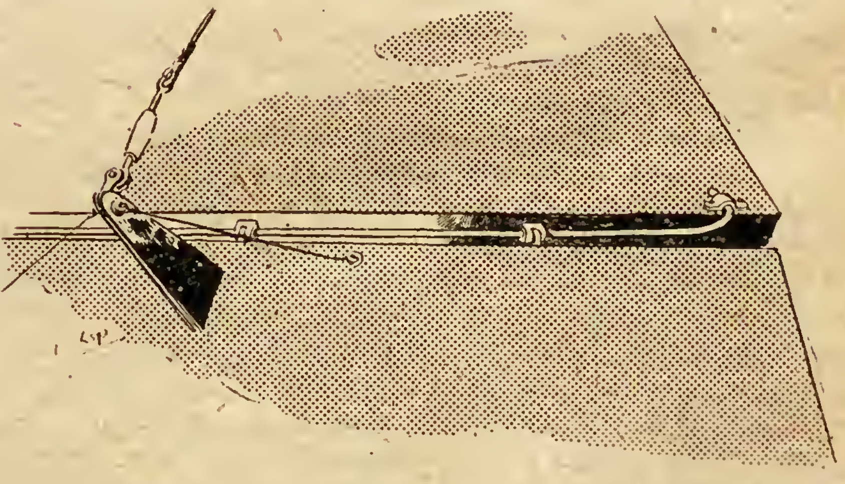


"Flight" Copyright.

The tail skid of the L. and P. biplane.

The engine—an 80 h.p. Anzani—is mounted in the usual manner on a capping plate bolted to the rails of the body. In order to further stiffen the mounting, two tubes are taken from the bolts of the crank-case to the top of the inner inter-plane struts. Just behind the engine the body is covered with aluminium plates, that of the top being neatly curved to form a better entry for the air.

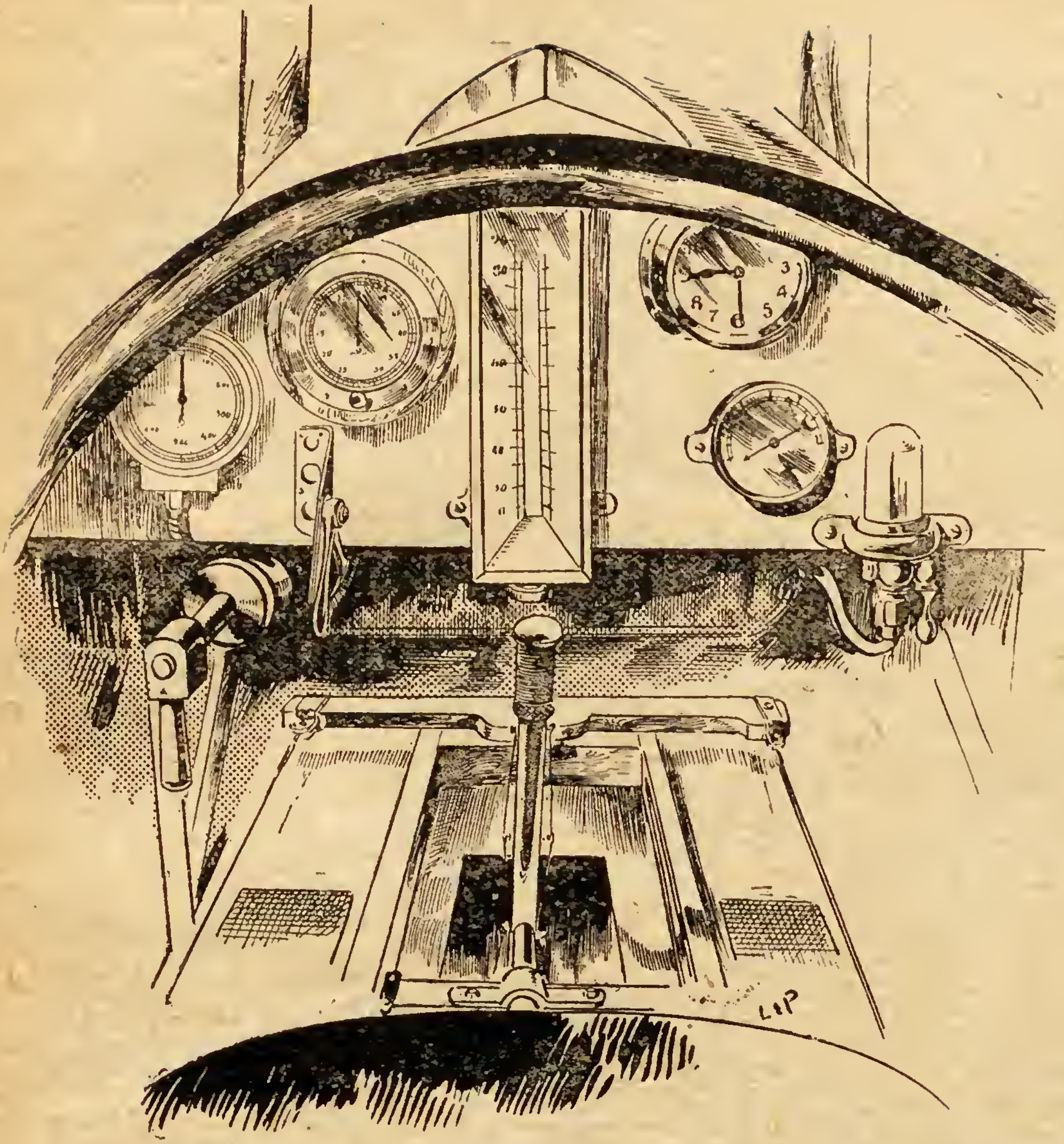
The main planes, which are of a section somewhat similar to the R.A.F. 6, with the exception that the lower surface is slightly more cambered, 1½ in. to be exact, are characterised by heavily raked tips which tend to give the machine a "racy" appearance, and which perform the more useful function of decreasing end losses and increasing the effectiveness of the *ailerons*. The latter are fitted to both top and bottom planes, with the result that the machine has an ample margin of lateral control, as demonstrated a few days ago, when Mr. G. Smiles, accompanied by a passenger, put up some alarming banked turns, during which the wings were repeatedly in a vertical position.



"Flight" Copyright.

Elevator crank lever and hinge on the L. and P. biplane.

One of our sketches illustrates the attachment of the lower wing spars to short spars passing under the body.

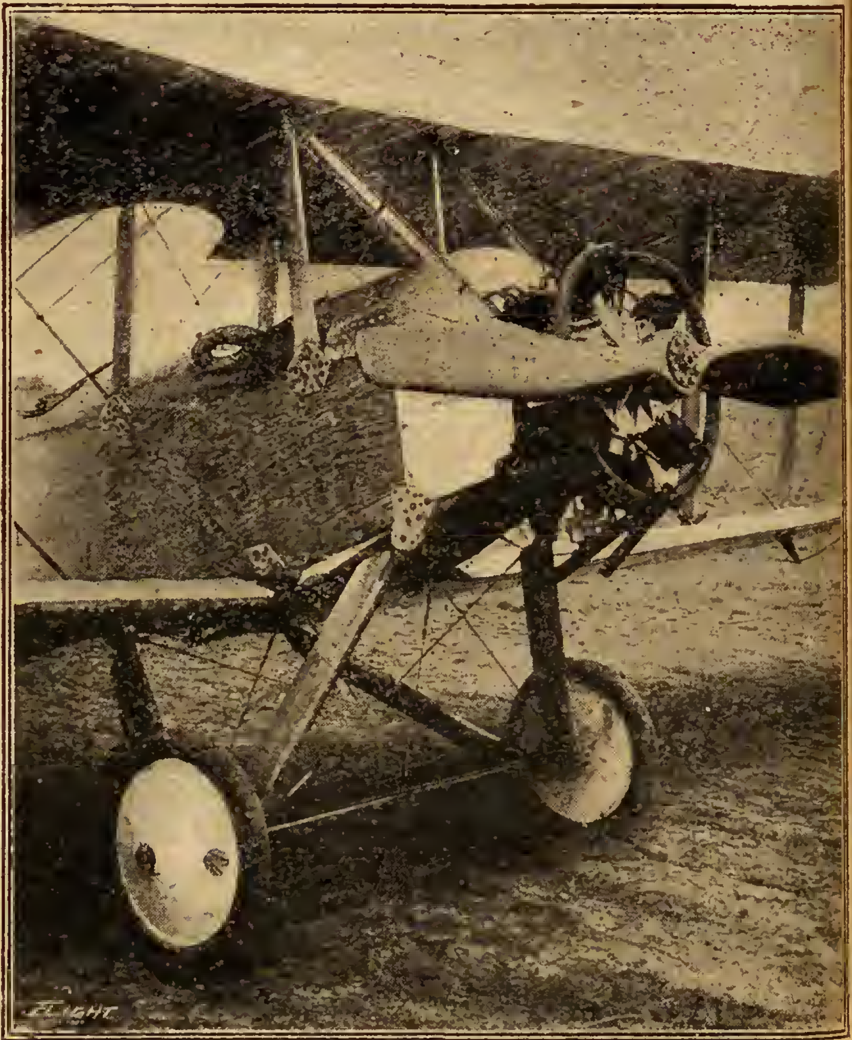


"Flight" Copyright.
The instrument board of the L. and P. biplane.

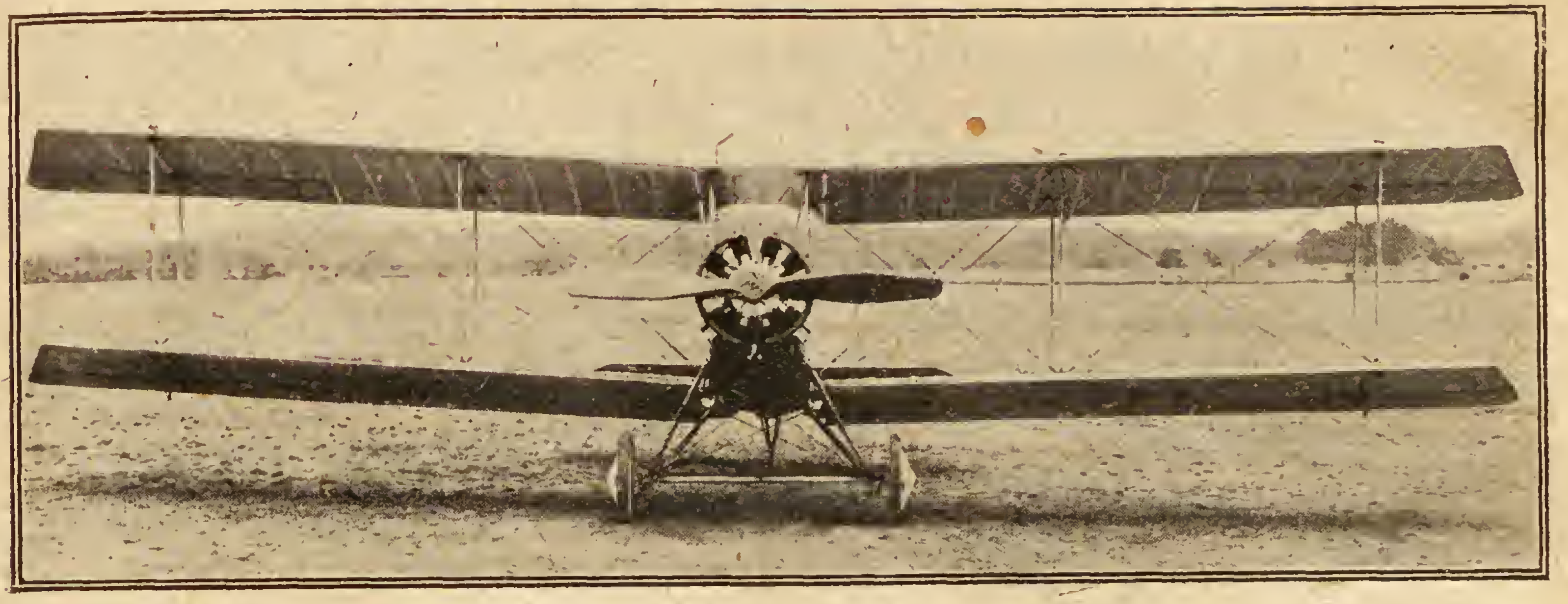
Let into each side of the centre spars is a plate, semi-circular at its outer end and angular at the inner end. Four bolts pass through each plate and through the spar. On the inner ends of the main wing spars are two similar plates, bolted to the spars in the same manner. These latter pass outside the plates on the centre spars, and a hinged joint is formed by a long hinge-pin passing through the central hole in the end of the plates from back to front spars. One end of this pin is bent over at right angles, and is prevented from coming adrift by a small aluminium clip passed over the bent end and screwed to the inner rib of the wing. In the same sketch is shown the anchorage for the lift cables. Two magnified chain-links are secured to the spars of the centre section of the lower plane by a sturdy bolt, and as the spars themselves are at this point of generous proportions, the stresses are adequately dealt with. Another point in favour of this method of passing the spars right underneath the body is that the final point of anchorage for the lift cables is immediately below the bottom rails of the body, so that no twisting strain is imposed on the rails. At the outer ends of the chain-links referred to above is another stout bolt around which passes a plate receiving the ends of the wire strainers in the manner shown in the sketch.

One of the features of the new L. and P. biplane is the type of wiring plate and inter-plane strut socket employed. One form of these consists of a rectangular plate to which the socket is welded, provided with the necessary lips for attachment of bracing cables. At each corner of this plate is a hole for a bolt passing through the wing and through a similar plate on the other side of the spar, minus the socket, of course. The four bolts on being tightened up cause the two plates to grip the spars, and the plates are further prevented from sliding along the spars on account of the obliquity of the bracing cables by letting the bolts into the sides of the spars to the extent of half their diameters. The fitting used for the outer struts is similar, except that here only two bolts are employed, the place of the other two being taken by two strips of the wiring plate itself bent around the side of the spar.

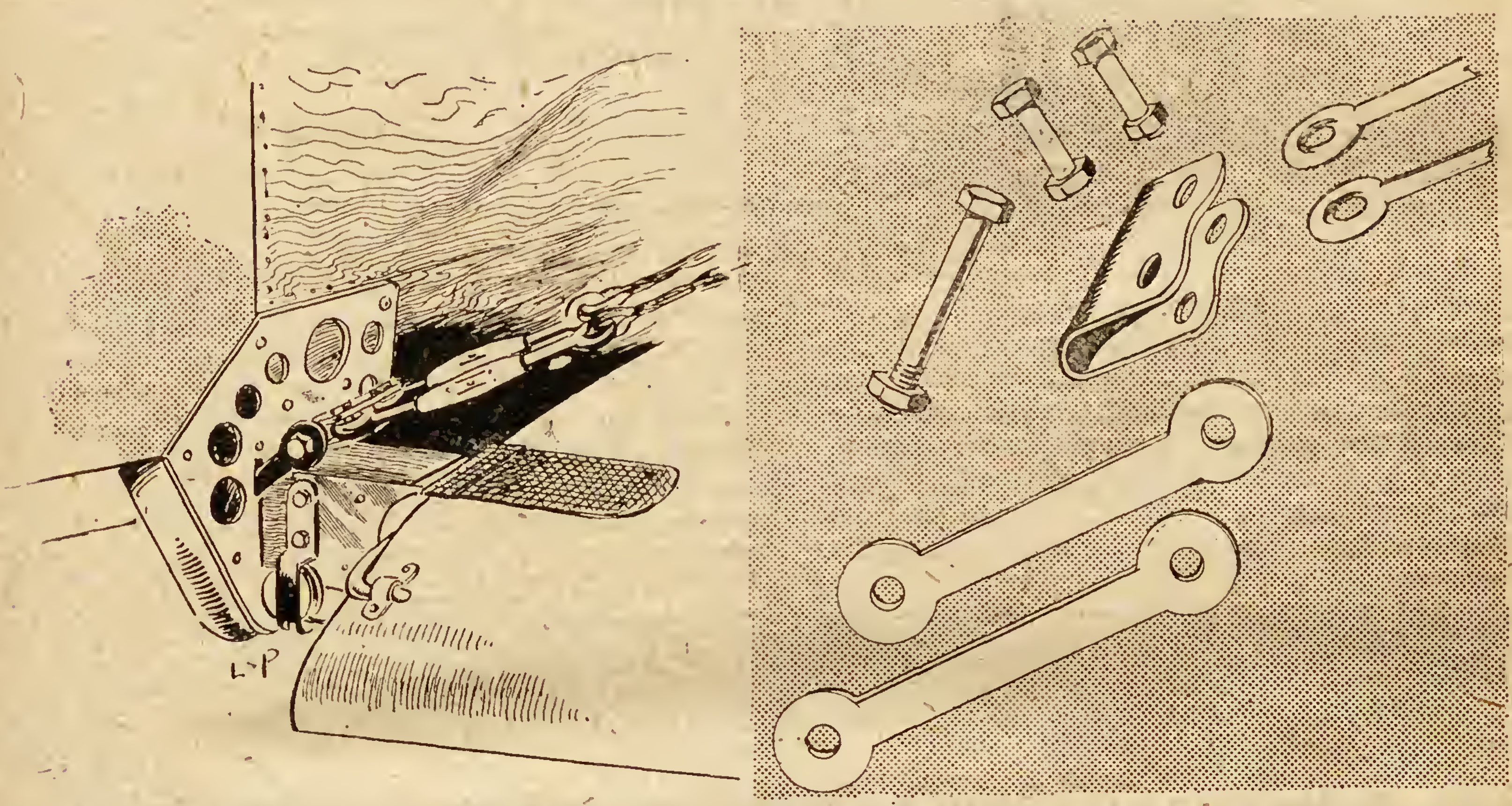
The hinge for the *ailerons* is formed by forked eye-bolts passing through the spars and ordinary eyebolts in the leading edge of the *aileron*. A long wire bolt runs right through all the eyebolts, thus doing away with the ordinary short bolt and nut for each hinge, which would be somewhat inaccessible in the narrow slot between the rear spar and the *aileron*. An exactly similar hinge is employed for the rudder and elevators. Regarding the various members of the tail these give the impression of being unusually large, but from the severe tests of stability carried out recently it would appear that the control organs, while being large enough to ensure that any tendency to pitching or



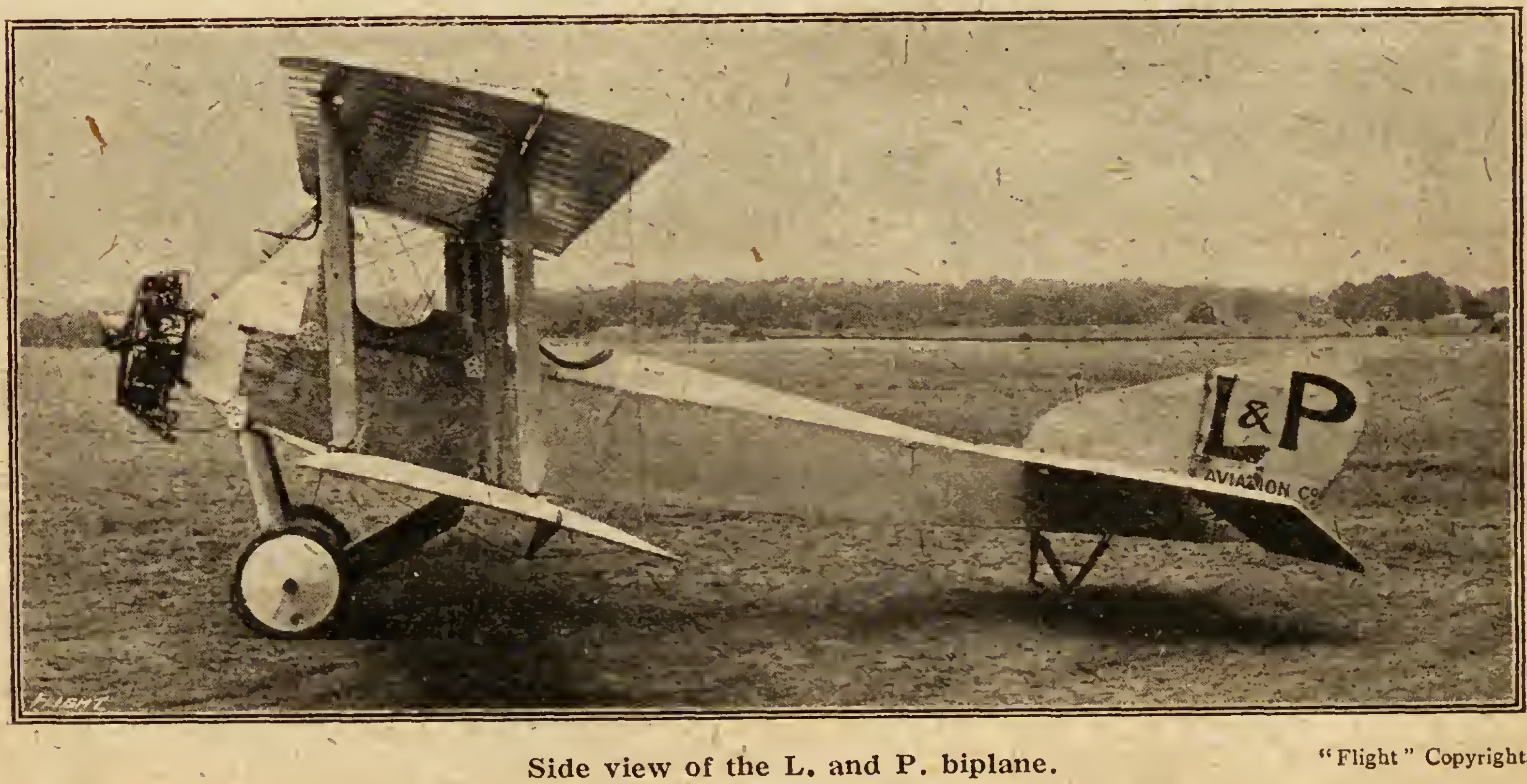
"Flight" Copyright.
Chassis and engine mounting of the new L. and P. biplane.



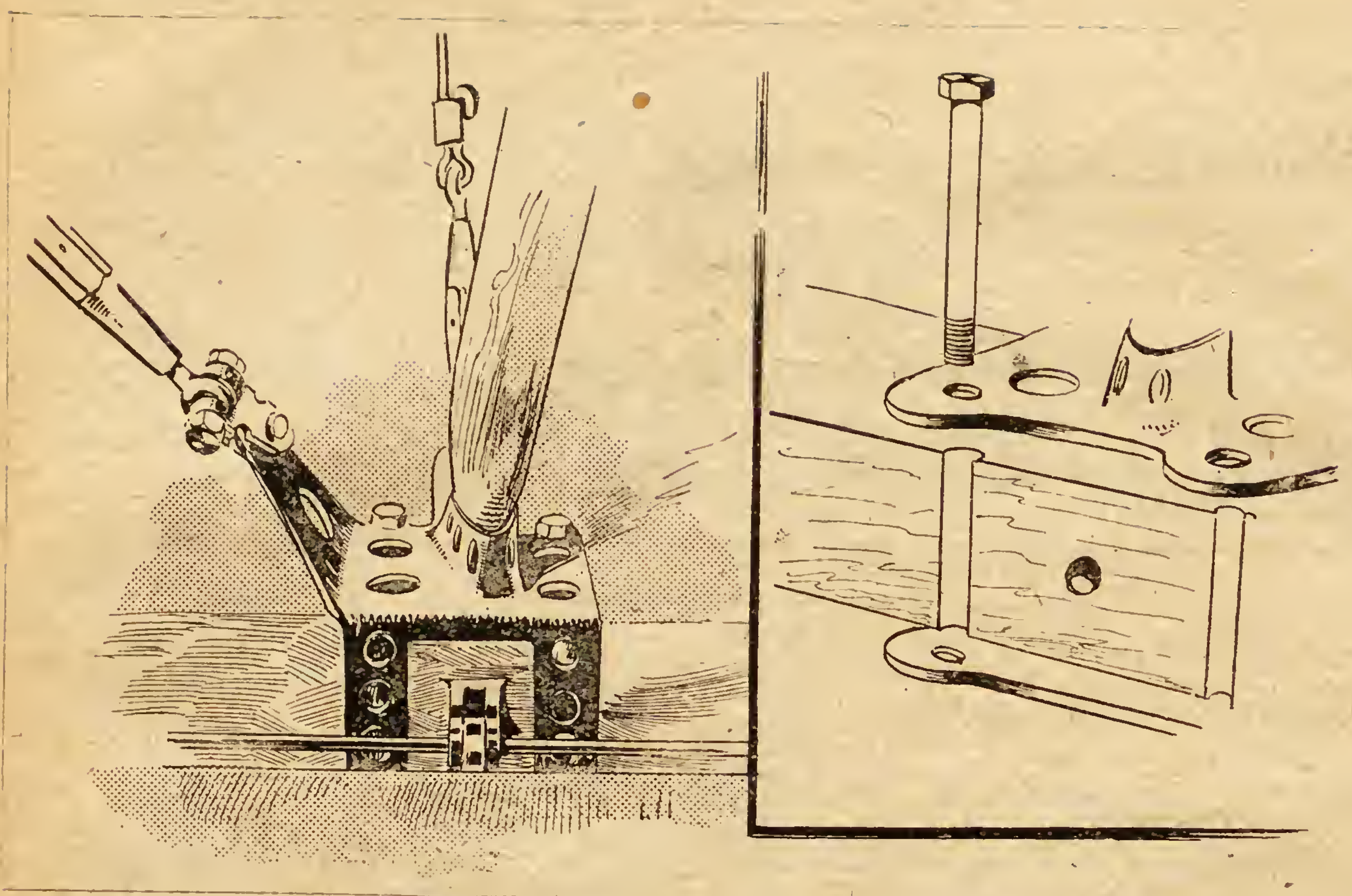
Front view of the L. and P. biplane. "Flight" Copyright.



ATTACHMENT OF L. AND P. WING SPAR TO CENTRE SECTION OF LOWER PLANE.—Inset analytical sketch of the anchorage for the main lift cables.



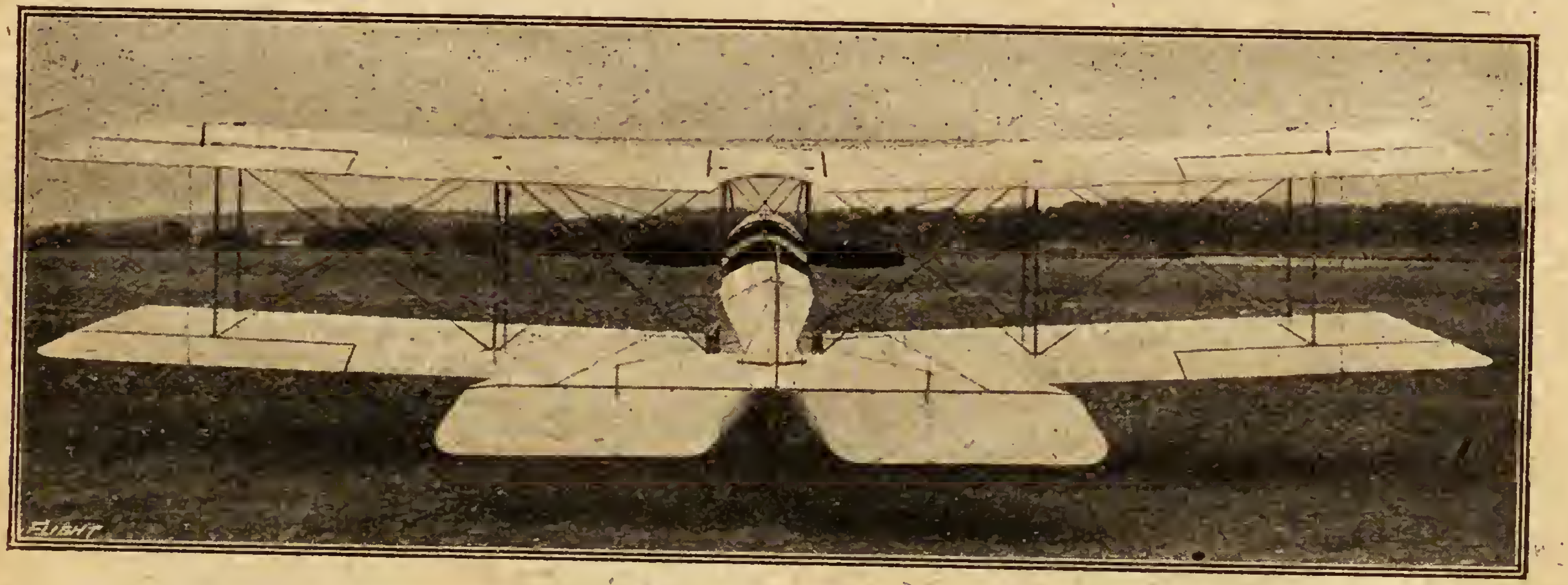
Side view of the L. and P. biplane. "Flight" Copyright.



"Flight" Copyright.

Another L. and P. Strut Socket. Inset is shown how bolts are halved into side of spar.

yawing is effectively stopped, are not so large as to cause any difficulty in the way of too great or weathercock stability. The fixed tail plane is of the non-lifting type in so far as it is set at no angle of incidence to the axis of the propeller, but while its lower surface is flat its upper surface is cambered to allow for the fact that it is working in the slip stream from the propeller and in the down draft from the wings. A small swivelling skid mounted on a pyramid of steel tubes, streamlined with wood fairings, protects the tail planes against contact with the ground.



Rear view of the L. and P. biplane.

"Flight" Copyright.

When looking casually at the machine, the chassis appears to consist of four streamline wood struts supporting the axle, but on closer examination it is found that the struts are in reality steel tubes encased in a fairing of wood. Two transverse steel tubes connect the lower apices of the Vees formed by the chassis struts, and the Duralumin tubular axle is slung from the tubular struts by rubber cord.

Altogether the London and Provincial Aviation Co. are to be congratulated on their first machine of original design. The workmanship is such as no large firm would need be ashamed of, in fact it would be difficult to improve on it, and the designer, Mr. Fletcher, has good cause to be proud of the machine from an aerodynamical as well as from a constructional point of view, seeing that it has already done some very excellent performances, including looping with two up, although the engine was far from being in concert trim, ticking, in fact, over at somewhere in the neighbourhood of 900 r.p.m. instead of the regulation 1,250. Even so the speed was something like 75 m.p.h., and when the new Lang propeller ordered for the machine arrives, this figure is expected to be considerably exceeded. The total weight "all up," including pilot, passenger, and three hours' fuel, is 1,400 lbs., which is very light for a machine of this size. We have no official figures regarding the gliding angle, but it appears to be extraordinarily good, probably in the neighbourhood of 1 in 10.

ARMCHAIR REFLECTIONS

by the Dreamer

It stood out in the long grass, for this is summertime, and although weather conditions are such that it would be hard to guess exactly the time of year, grass, seemingly independent of the coaxing warmth of the sun, grows, as it were, by almanack.

The article indicated by the pronoun in the foregoing paragraph is an aeroplane, and as I lay in the long grass watching its antics, I was amused.

For it was a windy day, one of those days when it would not be thought advisable to leave an aeroplane out in the open unattended, and it was lightly loaded, having had its engine removed, by which explanations you shall guess that it was an old machine and of no account.

In very truth it looked old; broken down with age; enfeebled by its infirmities; worn out. Its colour scheme was that of the lower back premises of an old, damp, dilapidated mansion where blue-wash, peeling from the walls, reveals white-wash, or white-wash discovers blue-wash, none may tell which.

It frisked about as the gusts struck it, heading to east and to west. It spun in a half circle and lifted its tail into the air like unto a foal spinning round and delivering its baby kick, and I fell to watching it, and as I watched, my amusement faded, and sober thoughts prevailed in their stead.

I glanced to the left, and in the shed stood its successor, resplendent in its cream-coloured dope, every wire glistening, every strainer bright with newness. Many men fussed around it, feeling its every bracing, drumming with fingers on tightened fabric, guessing at its speed and its lift and its climb, for it had not yet taken the air.

And the owner came to me and laid down with me in the grass, and told me of the old 'bus. It was not yet eighteen months old, so soon does a machine pass from the new love to the scrap-heap. I glanced at the beauty in the shed, and wondered.

Yet did the owner feel something for the old 'bus, even as I myself felt. Not a bit of timber, he reflected, had ever been replaced since she was new, all had come safely through the trying ordeals of school work, just a few new wires, or a wheel, or what not, the rest as I saw it now was as it left the builders' hands, only last year.

And the pilots, what of the men who, seated in her little blue boat, felt the thrill that comes with the first free flight into the air, the first long straight across the aerodrome at but a few feet above the ground, yet enough to bring that feeling which comes with a knowledge of conquest. I can imagine nothing in life to equal the sensations experienced by the embryo pilot landing after his first solo flight.

Doubtless many of these men who took the little blue 'bus into the air on their first trip, have had many and varied experiences since then, experiences that have brought new thrills—thrills and honours. Battles-Royal have been fought in the air. Bullets have whistled round and about. Enemy machines have been seen to turn turtle and drop into space almost incalculable. I can imagine I hear the shout of victory given by the pilot as he sees his overcome enemy disappear beneath him, when, wheeling his machine about by a manipulation of the control learned on the little blue 'bus, he brings his magnificent warplane safely to earth in friendly lines—and the little blue 'bus gives a spin and a kick as if it knew.

I walked over and made a closer examination of the little assemblage of wood and fabric. Here was a strut that had been cracked a little, and bound up with tape. I can imagine the sound rating the pilot got from his instructor for the clumsy landing he made. Probably since that day he has broken many struts in such way as to bring nothing but praise from his superior officers.

Here, again, is a short length of fine wire twisted round a part where a rib has protruded a little. Perhaps the fingers that twisted it are at this moment busy with the trigger of a Lewis gun, or maybe, crossed upon the breast of their owner beneath the soil of France.

I am quite certain that if I were a pilot, I should want to take that little blue 'bus away somewhere and carefully store it where it could drop quietly to pieces in an honoured old age.

Well, this is all sentimentality, and deserves to be nipped in the bud. We cannot in these times afford to be sentimental, and it is obviously impossible to store all the machines that have carried blossoming pilots, so away with such dreamings.

Yet, perhaps after all, it does not do one any harm to just let one's thoughts travel for a few moments along the road indicated and compelled as the natural consequence of looking at such a thing as that old and worn aeroplane. We should be poor people indeed did we not at times have some feeling for that and those who have served us in the past.

I am perhaps too given to store up things which have associations, and dread to part with anything which for me has the power of refreshing memories, but then I am a "Dreamer," and as such, perhaps, excusable. Dreamers are funny creatures, prone to dream.

I claim, however, superior intelligence to those who make a god of the family tool box, storing up old iron, and nails, and bolts, and broken hinges, and castors, and rusty bits, of no use whatever to anybody, always forgotten when wanted, and new purchases made. I am, I say, above that, and with it I bracket china with the names of seaside resorts upon it.

Yet I have a feeling for that little blue 'bus. I feel it has intelligence. I feel that if it is left there in the wind it will, when in extremities, take itself into the air, and flying cross-country, pile itself up in a field —respectably.

FROM THE BRITISH FLYING GROUNDS:

Grahame-White School, Hendon.

Straights with instructor last week: Messrs. Alty, Ballard, Duncan, Drew, Fisher, Jamie, Lyles, Mills, Ormerod, Saunders, Soden, Stevens and Ward. Circuits with instructor: Messrs. Cockell and Donald. Eights with instructor: Messrs. Kay and Parkinson. Eights alone: Mr. Forster.

Instructors: Messrs. Manton, Winter, Russell, Hale and Pashley.

Beatty School, Hendon.

The following pupils were out during last week: Messrs. New, Hathaway, Gliksten, Cuthbert, Edwards, Skeet, Towson, McPherson, Garlick, Elliott, Rudd, Earl, Austen, Curry, Mitchell, Sach, Owen, Gadsden, Wood, de Wilde, Campbell and White.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes.

Certificates were taken during the week by Messrs. H. V. M. Hoskins, G. W. Dowding, J. A. Davy and W. W. A. R. Murdoch on Caudron biplanes.

Hall School, Hendon.

Pupils at work last week: With Cecil M. Hill: Messrs. Collier, Davis and Duncan. With P. G. Allen (for Mr. Glegg, indisposed), doing rolling practice only: Messrs. Dutton, Orton, Smith, Yuill, Mayer and Stampes. With P. G. Allen, doing good flights at 10 to 50 ft.: Messrs. Orton, Henley, Cownie, Russell and Lambert Barton.

Royal Aero Club certificate taken by Mr. Collier in excellent style.

Ruffy-Baumann School, Hendon.

Pupils out with instructor last week: Messrs. Beebe (25 mins.), Trubridge (34 mins.), Durand (8 mins.), Barnes (1 hr. 45 mins.), West (1 hr. 40 mins.), De Balme (37 mins.), Williams (50 mins.), Holmes (2 hrs. 10 mins.), Carr (32 mins.), Thomas (27 mins.), Fanshawe (1 hr. 15 mins.), Westlake (37 mins.) and Bailey (12 mins.). Pupils doing solo flights: Messrs. Williams, Durand, Beebe, Wilson and De Balme.

Three tickets taken during the week, viz.: Messrs. Durand, Beebe and Wilson, all of whom flew in splendid form.

Instructors: Edouard Baumann, Felix Ruffy, Ami Baumann and André Thomsen.

60 and 50 h.p. Ruffy-Baumann dual-control biplanes in use.

Bournemouth School.

Pupils with instructor last week: Messrs. Brandon, Little and Daniel Barlow. Rolling alone: Messrs. Kennedy, Green, Brandon, Turner, Hinchliff, Wingfield, Ross, Montgomery, Holland, Owen and Wilmott. Doing straights: Messrs. O. Wilson, H. Smith, Adamson, Barlow, Daniel, Scaramanga, Hammersley, Little, J. B. Smith, Pritt and Fenn. Half circuits alone: Messrs. J. Wilson, Barlow. Mr. Barlow practising certificate tests.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

35, 45 and 60 h.p. Caudron biplanes in use.

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Three pilots who have recently secured their Certificates at the Ruffy-Baumann School, Hendon.—(1) Mr. A. R. Cox, (2) Second Lieut. A. W. Williams, (3) Mr. W. Whitaker.

PERSONALS.

UNDER the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Captain Geoffrey Asteley Burney, R.F.C., who was killed on July 7th, was born in 1884, and was the younger son of Arthur G. Burney, of The Weir, near Hereford. When war broke out he was engaged in work for the British Museum in Siberia, and returned with great difficulty and after many delays to join the Army. He received a commission in the Scottish Horse in October, 1914. He was attached to the Royal Flying Corps in August, 1915, received his pilot's certificate in October, and went to the front in December, attached to No. 4 Squadron. In January he was promoted Flight-Commander. On the day of his death the Brigadier-General wrote: "His work in the air was beyond praise"; and his Commanding Officer: "He was by far the ablest and one of the very bravest artillery observers I have met."

Captain Charles D'Arcy Edmund Wentworth Reeve, Suffolk Regiment and Royal Flying Corps (killed on July 18th whilst flying), was younger son of Mr. C. S. Wentworth Reeve, Thorpe Satchville, Melton Mowbray, and Livermere Park, Bury St. Edmunds. He was 21 years of age, and after entering the Suffolk Regiment he specialised in aviation and obtained rapid promotion. He held the rank of Temporary Captain whilst Fight-Commander in the R.F.C.

Lieutenant Jack C. Simpson, R.F.C., killed in action on July 1st, was the son of Mr. and Mrs. Simpson, of Guelph, Canada. When on early morning patrol duty on July 1st, he was attacked by no less than six German machines, against whom he put up a splendid fight, his machine at last coming to ground between the British first and second line of trenches.

Second Lieutenant Walter William Gordon Beatson, R.F.C., killed whilst flying at Hounslow on July 18th, was the youngest son of the late Mr. W. W. G. Beatson and Mrs. Beatson, of Shortlands, Kent, and grandson of the late Major-General Beatson, R.E. He was educated at Stubbington House, Fareham, Hants., and Uppingham. Leaving the latter in December, 1915, he obtained a commission in the R.F.C. in May, 1916. He only came to Hounslow from Brooklands, where he had previously been flying, on the day of his death. His eldest brother, Lieutenant R. S. M. Beatson, was killed in the fighting near Albert on July 2nd, 1916. He has another brother, Lieutenant C. G. Beatson, also in the R.F.C.

Married and to be Married.

A marriage has been arranged, and will shortly take place, between Captain H. Eric Dixon, Middlesex Regiment and R.F.C., elder son of the late Mr. A. E. Dixon, of Eastbrook Hall, near Cardiff, and of Mrs. Dixon, Stonehouse, Gloucester, and Muriel, second daughter of Lieutenant-Colonel F. K. P. Metford, V.D., and Mrs. Metford, of Fox Elms, Robinswood Hill, Gloucester.

A marriage has been arranged, and will take place in October, between Cecil Lyndon Blake, R.F.C., eldest son of Captain H. Lyndon Blake, Resident, Sokoto, Northern Nigeria, West Africa, and Mrs. Blake, Ingledene, Forester Road, Bath, and Margaret Eleanor, twin daughter of the Rev. Montague Hardey, Sub-Chanter of Lichfield Cathedral, and Mrs. Hardey, The Close, Lichfield.

Items.

Mr. W. B. Ellis, of Glendower, Fenham, Newcastle-on-Tyne, received on Saturday last a letter from his son, Lieutenant W. Baxter Ellis, R.F.C., officially reported missing since July 3rd, stating that he is safe and well, and is being kindly treated by officers of the German Flying Corps. He had the bad luck to be brought down by anti-aircraft guns and a couple of Fokkers. The letter had been dropped by a German machine over the British lines. Lieutenant Ellis is a grandson of Sir Joseph Baxter Ellis, of Newcastle-on-Tyne.

* * *

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to July 18th, 1916	10,783	17	7
Collected at the Westland Aircraft Works, Yeovil (Forty-first contribution)....	0	18	3
Officers and Men of the Royal Naval Air Station, Chingford....	12	10	1
Total, July 25th, 1916	10,797	5	11

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

* * *

Flying Across Germany.

The first news of the flight of a French aviator appeared in a report from Pinczow to the *Krakauer Zeitung*, of Cracow, which stated that a French aeroplane was observed by Austrian and German soldiers landing near Kawenczu (roughly 60 miles from the Russian lines) in a field. The soldiers approached the machine, and the aviator, on seeing them, tried to escape. He was captured, and then stated that he was a French officer who had flown from Nancy, crossing the whole of Germany in his journey.

The officer, who was making for Rovno, when he learnt that he had come down behind the German lines, broke down through disappointment. The machine is of the Nieuport type.

It was officially announced in Paris on July 24th that Lieut. Marchal flew over Berlin on the night of June 20th, dropping some leaflets. He continued his journey towards the Russian front, but was forced by engine trouble to land at Cholm in Poland, when only 63 miles from the Russian trenches.

He left Nancy at 9.30 on the evening of June 20th on a special type of Nieuport monoplane carrying enough petrol—the tank capacity being 165 gallons—for a 14-hour flight. He reached Berlin without difficulty, and dropped a proclamation, in German, which was prefaced: "We might have bombarded the open town of Berlin and thus killed women and innocent children, but we contented ourselves with throwing the following proclamation:—To the People of Berlin.—Many clear-sighted Germans know to-day that the war was let loose by the military advisers at the Berlin and Vienna Courts. All the official and semi-official lies and perversions cannot do away with the fact that the German Government, with the connivance of the Austrian Government, desiring this war, consciously and with premeditation made it inevitable."

Lieut. Marchal is now interned at Salzerbach, from where he has sent the following information:—

"I was made prisoner on June 21st at 8.30 in the morning at Cholm. Austrian officers were disinclined to believe what I had done, but proof came and they had to admit the truth. It was sparking-plug trouble which made me come down. I landed, changed two plugs, and started the motor again, but unfortunately two others wanted changing and I was captured. Imagine my sorrow."

Lieut. Marchal in this flight travelled about 811 miles, mostly in night flying.

This official estimate is rather under than over the distance, as it is claimed that as the crow flies it is some 400 miles to Berlin, and about 440 miles from there to Cholm.

QUESTIONS IN PARLIAMENT.

R.A.F. Witness at the R.F.C. Inquiry.

Mr. Burgoyne, in the House of Commons on July 19th, asked the Secretary of State for War if he is aware that in the case of a witness from the Royal Aircraft Factory who recently appeared before the Judicial Committee as Mr. A, although his name was given in confidence to the said Committee, Colonel O'Gorman, on the afternoon of that day, communicated to the assistant superintendent of the factory, Major Heckstall-Smith, the fact that the said witness was a viewer, Mr. Valentine, and as a result Mr. Valentine was taken seriously to task by the assistant-superintendent; and will he say what action he proposes to take?

Mr. Forster: Mr. Valentine's name was not disclosed by Colonel O'Gorman. Major Heckstall-Smith identified Valentine from the Press reports of his evidence, and on his own initiative had an interview with Valentine to enable him to investigate the breaches of discipline, &c., on which Valentine had given evidence. He had no intention of taking Valentine to task, but assured him at the interview that he had a perfect right to hold any opinion he liked, and that nothing he said would be used to prejudice his position. No disciplinary action whatever had been taken against Valentine.

A similar question was asked on the following day by Mr. Bennett-Goldney.

Mr. Bennett-Goldney also asked whether, as the War Office itself set up the Air Committee to inquire into certain allegations made against the administration of the Air Services in this House, if the recruiting officer concerned received an official or unofficial message from the War Office to issue a warrant for the arrest of one of the principal witnesses giving evidence before the Committee as an unattested man; and whether, as the hon. Member for East Herts had been medically examined and placed in a class for Home defence, he will give an assurance, so as to prevent any possible misunderstanding, that the question of issuing such a warrant at such a time was not intended in any way to prevent any evidence being given, but that it was purely a matter of indiscriminate routine?

Mr. Forster: I cannot find that any warrant for the arrest of the hon. Member for East Herts was ever issued or contemplated. He was called up automatically, and any suggestion that there was any departure from the usual procedure or that there was any interference of any sort or kind by superior authority in this case is without foundation. As a fact, what took place was, as the hon. Member suggests, "a matter of indiscriminate routine." The House, and also the hon. Member for East Herts, will, I am sure, agree in desiring that no discrimination should be made in this matter in favour of Members of the House.

Waste of Petrol at Aerodromes.

Mr. King, on July 19th, asked the Financial Secretary to the War Office, who had outlined the steps taken to prevent waste of petrol in camps, if similar care was taken with the waste of petrol that is going on at aerodromes, which was very great.

Mr. Forster promised to communicate with the proper authorities.

Aircraft Raids and Compensation.

Mr. Crooks asked the Home Secretary on July 24th whether steps will be taken to provide that workmen injured by enemy air raid or bombardment shall be compensated on the same basis as under the Workmen's Compensation Act when the accident is in any sense due to the nature of the employment.

The Under-Secretary of State for the Home Department (Mr. Brace): I am advised that according to recent judicial decisions a workman injured by air raid or bombardment in the course of his employment will be entitled to compensation under the Act as it stands at present, if he can show that by reason of his employment he was exposed to special risk not shared by the public at large.

R.N.A.S. Schools.

Mr. Shirley Benn asked the First Lord of the Admiralty whether further aerodromes are required for training in the Royal Naval Air Service; and whether the demands in this direction, although maintained by the highest expert authority and advice, are receiving the support of the Treasury.

Dr. Macnamara: The training schools of the Royal Naval Air Service, for which approval has been given to date, are considered sufficient to meet the requirements of that Service. All large works undertaken by the Admiralty, such as these, are carried out with the concurrence of the Treasury.

The Lights o' London.

Sir C. Kinloch-Cooke asked the Home Secretary whether his attention has been called to the observation made by the magistrate at Highgate when a householder was summoned for showing too bright a light at 10.14 p.m.; whether the penalty for the offence is £10 and the householder was only fined 1s.; and whether, in view of the danger caused by showing a bright light after the specified hour, he can see his way to make some statement supporting the inspector who gave evidence on that occasion in support of the action taken by the police?

Mr. Samuel: From the remarks made by the chairman of the Bench when passing sentence in this case it would appear that the justices took into consideration the explanations offered, and particularly the fact that the occurrence took place very shortly after lighting-up time. No intervention on my part appears to be called for. The maximum fine that can be inflicted in such cases is £100.

R.F.C. Aerodromes.

Mr. Prothero asked the Secretary of State for War whether he is aware that in February last the Army Council, under the Defence of the Realm Act, took possession of some 112 acres of land at "Blank," in Hertfordshire, only 12 acres of which are grass, and that on July 13th last it was intimated that a further 100 acres of arable land adjoining the land taken in February would be required; whether he is aware that this leaves the owner with no arable land on which to support a valuable herd of shorthorns; whether the policy of taking arable land for flying stations or pilot schools is likely to be extended; and whether he will consider the desirability, in the interests of food supplies, of obtaining the requisite areas from grass land rather than from arable land?

Mr. Forster: If I have identified "Blank" correctly, the answer to my hon. friend is that before the site in question was finally selected all the land in the locality was carefully reconnoitred, with the result that no other site suitable could be found. I can assure my hon. friend that it is the policy of the Department to avoid taking arable land where other land is available; and in the case of the Royal Flying Corps there are technical reasons connected with the work of that Corps, apart from the important question of food supply, why arable land should be avoided.

Mr. Shirley Benn asked whether further aerodromes are required for training in the Royal Flying Corps; and whether the demands in this direction, although maintained by the highest expert authority and advice, are receiving the support of the Treasury?

Mr. Forster: The answer to the first part of the question is in the affirmative, and also the second part if I have put the correct construction upon it.

Mr. Watt: Is the hon. gentleman aware of the extraordinary difficulty of getting a transfer from the class of observers into the class of pilots, and ought that to be so?

Mr. Forster: It is obvious that there must be some difficulty in a highly technical occupation such as observing pilots.

The Supply of Pilots.

Mr. Ashley, on July 25th, asked the Secretary of State for War whether he is satisfied with the supply of pilots; and whether, in view of the growing demands of the Air Service, he will consider the claims of our public schools as nurseries for the future supply?

Mr. Forster; I am advised that the supply of pilots is at present satisfactory. The answer to the second part of the question is in the affirmative.

Egypt as a Training Ground.

Mr. Peto asked the Secretary of State for War whether the meteorological and geographical advantages of Egypt have been considered for training pilots for the Air Services; and whether he proposes to establish aerodromes there before the coming winter?

Mr. Forster: The answer to both parts of the question is in the affirmative,

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *General Headquarters, France, July 20th.*

"Yesterday our aeroplanes carried out successful bombing enterprises by day and night. Many tons of explosives were dropped with marked success on railway centres, enemy aerodromes, and other important points. One hostile aeroplane was destroyed, and several others were forced to the ground in a damaged condition.

"Since the 16th instant four of our machines have failed to return to our lines."

General Headquarters, July 21st.

"Taking advantage of the fine weather, the Royal Flying Corps yesterday continued their bombing operations against points of military importance, with successful results.

"Hostile aircraft were inactive until the evening, when a good deal of fighting took place behind the German lines. One of our offensive patrols encountered 11 German machines, as the result of which 3 enemy aircraft were shot down, 1 bursting into flames.

"Another encounter between four of our machines and six of the enemy's lasted for 45 mins. One Fokker was then shot down, and on another being badly damaged by our fire the remaining four broke off the fight. During many other combats in the air a fifth German aeroplane was forced to the ground. Our total losses during the day were one machine."

General Headquarters, July 22nd.

"Yesterday our airmen destroyed six hostile aeroplanes and forced several others to the ground in a damaged condition. One of our own machines was brought down by gunfire and two others are missing."

War Office, July 22nd.

"*Egypt.*—Hostile aircraft made an attack on Suez yesterday, causing a few casualties."

War Office, July 23rd.

"*Mesopotamia.*—Certain claims were made in the Turkish official *communiqué* of the 19th inst., to the effect that seven vessels had been captured on the Euphrates and the English detachments had been defeated in the neighbourhood of Basra, with the loss of an aeroplane. General Lake reports that these incidents are purely imaginary."

French. *Paris, July 19th. Evening.*

"A German aeroplane was brought down by the fire of our special guns near Braine (east of Soissons). The aviators were taken prisoners."

Paris, July 20th. Afternoon.

"In the region of the Somme a German aeroplane was brought down yesterday afternoon by one of our pilots to the east of Peronne. Another enemy aeroplane, after being attacked by our machines, fell to the ground near Gremilly (Verdun region) and was dashed to pieces."

Paris, July 20th. Evening.

"Our bombardment aeroplanes carried out numerous operations during the night of July 19th–20th. The stations of Thionville, Montmédy, Brieulles, and bivouacs near Azannes (Verdun region), and the station of Roisel (Amiens region) were subjected to a rain of projectiles.

"Another group of our aeroplanes also dropped eight heavy shells on the military establishments of Lorrach (north-east of Bâle.)"

Paris, July 21st. Afternoon.

"During the day of the 20th and last night our air squadrons bombarded several important points on the enemy front. The railway stations of Conflans, Mars-le-Tour, Longuyon, Brieulles, and the railway junction at Ham were vigorously bombarded with heavy bombs."

Paris, July 21st. Evening.

"A German aeroplane this morning dropped several bombs on Belfort. The material damage was insignificant."

Paris, July 22nd. Afternoon.

"Yesterday one of our air squadrons bombarded three times the railway station of Metz-Sablons. One hundred and fifteen large bombs were dropped on the station buildings and the sidings. Much damage was done. A German aeroplane which went in pursuit of our squadron was brought down. One of our machines, which was obliged to descend owing to engine trouble, has not returned.

"This morning a German aeroplane dropped bombs on Belfort. No lives were lost, and no damage was done."

Paris, July 22nd. Evening.

"Contrary to what was stated in this morning's *communiqué*, all the French aircraft which took part in the bombardment of the railway station of Metz-Sablons returned to our lines."

Paris, July 23rd. Evening.

"During the day of July 21st, our aircraft bombarded the railway station of Vigneulles, and during the night of July 21st-22nd the station of Thionville, where three large fires broke out, the station of Arnaville, and those of Laon and Saint Erne.

"During the night of July 22nd–23rd our aircraft again bombarded the station and military establishments of Thionville. One hundred and fifteen bombs were dropped altogether during these expeditions.

"On the morning of July 22nd a group of 12 French aeroplanes bombarded the military establishments of the town of Mulheim, on the right bank of the Rhine. Many projectiles were dropped on the railway station and the barracks, and most of them are reported to have struck their mark. On their return from this expedition our aircraft fought an engagement with an enemy squadron. Four German machines were brought down by our aviators, and were smashed. Two of ours had to land in the enemy's lines.

"This morning a German aeroplane bombarded Belfort, causing only material damage."

Paris, July 24th. Afternoon.

"Last night a German aeroplane dropped bombs on Lunéville. One person was wounded.

"Sub-Lieutenant Chaput yesterday brought down his eighth enemy aeroplane, which fell near Fresnes-en-Woevre.

"A second German aeroplane, attacked at close range by one of our airmen, fell and was smashed near the Vaux Fort.

"During the night of the 22nd-23rd and the day of the 23rd our bombarding aeroplanes dropped eight shells on Conflans Station, 40 on the barracks near Vigneulles, and 25 on the barracks and aerodrome at Drieuze."

Paris, July 24th. Evening.

"One of our pilots, Sub-Lieutenant Delorme, already mentioned six times in Army Orders, has just distinguished himself by a series of bombardments on the railway stations held by the enemy."

Russian. *Petrograd, July 17th.*

"One of our reports describes a fight in the air which took place over the enemy's encampments west of the Dvinsk positions, and which was remarkable for the coolness and courage displayed by our airmen. The volunteer airman, Puchkel, and the observer, Second-Lieutenant Kovenko, set out on an air reconnaissance. Beyond Aheli railway station our machine was suddenly attacked from the rear by a Fokker. The first shots wounded Lieutenant Kovenko in the hand, but this did not prevent our machine from wheeling round, and in its turn attacking the enemy, who was put to flight. After that our machine continued its reconnaissance, which it carried to a successful conclusion. Beyond Rakishki railway station the Fokker again attacked our machine, damaging it in several places by well-aimed fire. Nevertheless, under our machine-gun fire the Fokker rapidly flew off out of sight, but it soon returned and attacked our machine for the third time, just when Lieutenant Kovenko, in spite of his wound, was stopping up a hole which a bullet had bored in the radiator to prevent leakage of water, which would have forced our machine to land all too soon. Lieutenant Kovenko received a second wound, this time an explosive bullet in the stomach, but in spite of the gravity of the wound he completed his task and sat down again at the machine, opening fire. The Fokker was soon brought down. Puchkel, in spite of the serious damage to his machine, which was gradually coming down, and of the fire of the enemy batteries below, continued his flight, and with amazing courage and presence of mind brought the machine back to the aerodrome, with Lieutenant Kovenko gravely wounded and unconscious."

Petrograd, July 19th,

"Early yesterday morning four enemy aeroplanes dropped thirteen bombs on the town of Reval.

"Enemy aviators have shown great activity on the front south of the Dvina region to the district of the Pinsk marshes."

Petrograd, July 20th.

"On Tuesday 17 enemy aeroplanes made a raid on the station at Zamirie (north-east of Baronovitchi). As a result of 27 bombs thrown upon the hospital and ambulance station three persons of the medical staff were killed and five other men injured. Of the patients in the hospital 100 were killed and 23 men wounded."

German. *Berlin, July 18th.*

"Three Russian aeroplanes attacked our light naval forces at the entrance to the Gulf of Riga and unsuccessfully dropped bombs. Our anti-aircraft fire brought down one and compelled both the others to retreat."

Berlin, July 19th.

"Our air-squadrons successfully dropped numerous bombs on the railway stations at Horodzieja and Pogorjelzy, on the Minsk line, in the direction of Baronovitchi, on which there is much traffic.

"Early on Tuesday some German seaplanes dropped bombs on some enemy cruisers, torpedo-boats, and submarines, and the military buildings at the naval port of Reval. Numerous undeniable hits were obtained on the enemy's forces. For instance, four bombs were dropped on a submarine, and in the docks great conflagrations were caused. Despite heavy firing from the land and counter-attacks from enemy aeroplanes all our seaplanes returned safely to our naval forces, which awaited them off the Gulf of Finland. Though owing to the clearness of the weather our naval forces could be observed from the shore very early and their whereabouts were ascertained by an enemy aerial reconnaissance no enemy naval forces were sighted."

Berlin, July 20th.

"Near Arras, Peronne, Biaches, and Vermand enemy aeroplanes were shot down, two of them being brought down respectively by Lieutenants Von Wintgens and Von Hoehndorff. The Emperor has conferred the order 'Pour le Mérite' on Lieutenant von Hoehndorff, who, it is now announced, shot down another French biplane south-east of Peronne on July 15th."

Berlin, July 21st.

"In the course of an air fight a hostile aeroplane was shot down and destroyed south of Pozières, while another fell into our hands north-east of Bapaume."

Berlin, July 22nd.

"Both day and night aerial activity on both sides has been very great. Repeated bombing attacks by the enemy caused little military damage, but there were losses among the population in Laon, one woman being severely wounded and three children killed. The enemy lost seven aeroplanes in an air fight, four south of Bapaume and one each south of Arras, west of Combles and near Roye. Lieutenant Wintgens placed *hors de combat* his tenth and eleventh, and Lieutenant Loehndorf his tenth enemy aeroplane. The Kaiser has conferred the Order Pour le Mérite on Oberlieutenant von Althaus, in acknowledgment of his achievements. Oberlieutenant von Althaus, near Roye, brought down a French biplane."

Berlin, July 23rd.

"The towns of Muelheim and Brisgow and the surrounding villages were yesterday bombed by a French air squadron. In the cause of an air fight we shot down two enemy aeroplanes, and replied to the attack by bombarding the town of Belfort."

Austrian. *Vienna, July 24th.*

"On Sunday night Austrian naval aeroplanes dropped bombs on San Giorgio and Monfalcone."

Turkish. *Constantinople, July 24th.*

"Enemy airmen flying over Sedd-ul-Bahr (Cape Helles) were driven off by our fire."

From Other Sources.

Some account of our airmen's work at the opening of the great battle may be gathered from the following notes sent roughly in diary form by one of them in a letter to his friends at home, and published in the *Daily Mail* :—

"Three Nieuport scouts arrive. Fat little slug-like things they are, capable of terrific speed, and easily manœuvred. They have rockets for the destruction of the Hun sausages (kite balloons). These must not be allowed up during the strafe as they see far too much. So these Nieuports have come over specially to give some of them their *coup de grâce*.

"At night we hear on the 'phone that a Zeppelin is over the lines, but it is very doubtful.

"I am flying to-day early in the morning, so I shall see something of it now. We are going up to do a two hours' patrol and a target! Early in the morning we clamber into our machines and head for the lines. It is fairly obvious that something is doing down below, though we view it in a very dispassionate sort of way. Clouds of dust are obscuring the trenches and flashes are seen on every side, to be shortly followed by a mushroom puff of smoke as the shell explodes. Our battery is some time getting ready for us, but at last we are over the target and 'spotting' for our friends the gunners. It is a certain point in a trench we are going for, and we can see the brown earth being upheaved as the shells draw near their mark. 'Archie' (the anti-aircraft gun) puts up one or two at us, but does no harm. Our patrol done, we fly home to a rest till the evening.

"In the afternoon we are all excitement to see the 'sausages' strafed, but they are obscured by mist. One after the other the Nieuports leave the ground and hustle off to their goals. Each has his complement of rockets on board ready to be shot forth at the touch of a button. We wait for their return, and are delighted to see a flaming red mass fall to the ground far away. Soon the first machine returns and is surrounded by eagerly questioning groups. His answer is 'Yes,' and we greet it with a cheer. High up aloft we see number two. It is obvious that he has succeeded, for he is throwing loops and doing stunts all over the place. It is very simple. The hostile sausage is seen, and our pilot dives from 8,000 ft. Soon the unwieldy bulk of the machine is on his sights, but it sways from side to side as the winch exerts full power to bring it down. It is of no avail.' The moment has arrived, and the pilot presses his button. Simultaneously he does a vertical 'bank' to avoid crashing into the billowy mass in front. Eight fiery rockets lept forward. Six find their billet. A ribbon of flame springs into being along the length of the bag, and it slowly descends. But not for long. The flames spread into one terrific flash, and the blazing remnants crash headlong to earth, 5,000 ft. below. All the pilots bring back the same tale of success. But one thinks of the men in the balloon. They have not had a fighting chance, no opportunity to seize a parachute, and try one leap for safety. They must go down with the ship, in one last crash into oblivion. *C'est la guerre!*

"We are again up early in the morning, doing another target over the lines. The huge guns belch forth a red splash of flame and leap bodily backwards. It is a terrific spectacle when all four are fired together and leap off the ground in their furious discharge. To-day is very favourable for gas, and we know it will be let off at about 11.30. There is not much doubt about it when it is.

"At last the great day arrived. There was a terrific intensive bombardment from 6.35 to 7.30, tons of metal being hurled over into the German lines. From above it was impossible to see anything owing to terrific clouds of dust. Flashes came from all directions as the shells went hurtling on their errand of death.

"Finally at 7.30 two huge mines were sent up, and the first wave of infantry swept over. The cloud of dust and *debris* became even denser. Our 'contact patrol' machines could see nothing of the movements of our troops.

"In the afternoon I was up from 2 till 4, and never have I seen such a sight. The shell pitted earth looked like some diseased monster all pocketed and holed, with two terrific holes where two mines had gone up."

According to the *Times*, an officer in the Royal Flying Corps writes :—

"We have evidently accomplished the first state of the push. Lord! the country is a sight where all the fighting is going on. I came back over it the night before last. We were attacked by three Huns, one with a double engine. There were three of us. We were 35 miles east of the lines, and we drove them off and sent two down (not crashes though), and continued our job. I was very pleased, as my observer did splendidly, as my gun wouldn't fire, and the other two never saw the Huns for ages. I had seen and kept watching them for a quarter of an hour. One ought to have got us, as he dived right on me, but I think we hit him a good hit. Did I tell you the Huns dropped a note yesterday, 'Please give your bloody Flying Corps a rest.' We give them no peace now, and we do offensive patrols up and down their lines."

In an article in the *Matin* on a visit to the Somme front Senator Henri Bérenger says of the British guns :—

"The range of the monster 15-in. howitzer is regulated by aeroplanes. Its fire is extremely exact, and every minute it hurls a giant shell of 715 lbs. charged with a secret explosive."

In this connection a wounded German informed a correspondent of the *Frankfurter Zeitung* that the range finding for the British guns was effected with extraordinary precision by the British aviators. Every small column and every machine-gun was located from the air and bombarded with the greatest precision.

Moreover, the British did not content themselves merely with this reconnoitring work, but took an active and audacious part in the fighting on the ground.

The German was discreetly silent as to what the German aeroplanes were doing all this time.

The *Berlingske Tidende* states that at the end of last week two Zeppelins were patrolling the entrance of the Cattegat. The Zeppelins were accompanied by submarines. Several neutral and British steamers pursued by the Zeppelins and submarines succeeded in escaping.

Mr. W. Beach Thomas, in his despatch of July 20th to the *Daily Mail* from the Somme front, says :—

"This out-gunning, if I may extend the term a little, has been abetted by the airmen. They have cleared our side of the line of aerial bombers, and themselves done direct artillery work. I hear that in the neighbourhood of the raid in the north by Anzacs and others they dropped scores of bombs and registered two direct hits, one on a heavy howitzer and one on an anti-aircraft ·77 (3-in.) gun. They have done similar work here and maintain the complete mastery."

From Kordofan Province (Sudan) a staff non-commissioned officer has sent a description of the recent operations against Ali Dinar, the Sultan of Darfur, whose capital was recently seized. The writer says : "Not 1 per cent. of the people had ever seen a motor car, and an aeroplane with bombs made them think the heavens were falling on them."

A Reuter message from Cairo on July 20th says :—

"This morning some Turkish aeroplanes dropped bombs on Suez, mostly near a camp. One bomb was dropped on Port Tewfik."

Mr. W. Beach Thomas, writing to the *Daily Mail*, on July 17th, says :—

"I must give some further details of the strange association—surely the strangest in the war—of cavalry and aeroplanes in the advance of patrols towards High Wood (the Bois des Foureaux). At the moment that the cavalry were debouching a pilot saw a group of Germans and their machine gun hidden in the corn. His only method of telling the cavalry of the lurking danger was to descend and immediately open fire. His manœuvre was absolutely successful. The machine gun in the corn was turned upon him, and the cavalry galloped up almost with impunity. It is a fine example of the selflessness, the impersonal heroism of this war that the cavalry do not yet know the name of their partner in this dashing little affair.

"Similarly I heard the infantry in a front trench ask in vain for the name of an airman who filled them with delight. He always dipped, not up but down, when crossing the enemy's trenches and let off a few light-hearted rounds. In answer to hostile fire he usually looped the loop, to the great delight of all observers.

"Such a trick is not perhaps tactically sound or useful ; but the spirit that prompts it has completely driven off the German flier. One or two night and twilight German birds have been seen, but otherwise the air on our side of the line has been 'strictly preserved' since the opening of the offensive.

"Trespassers there are prosecuted with such alarming promptness."

BRITISH AIR WORK IN EGYPT.

The following account of the aeroplane raid on the enemy camp at El Arish on June 18th, giving details additional to those already published, was issued by the Air Board on July 19th :—

"On the morning of June 18th eleven of our aeroplanes left our base on the Suez Canal to carry out a bombing raid on El Arish. The objective was the enemy aerodrome, which had been definitely located the previous week.

"The attack took the enemy completely by surprise. When the first of our aeroplanes arrived at 8 a.m. two enemy machines had been run out of their sheds, and in one of them the pilot and observer were already seated preparatory to making their ascent, while a party of seven or eight mechanics were holding on to the wings or standing near the machine. They and the machine were blown to pieces by the first bomb, which was dropped on them from a height of 100 ft.

"Our aeroplanes arrived at close intervals and attacked both the hangars and the camp to the north-west of them, with bombs and machine-gun fire at a low altitude, whilst two escorting machines remained in observation at a great height. During the time our aeroplanes were subjected to a very heavy fire from machine and anti-aircraft guns.

"Altogether the raid lasted an hour and five minutes, during which time an open hangar, in which an aeroplane could be seen, was hit and set on fire, and another hangar was seen to be ablaze ; several direct hits were obtained on four other hangars ; a party of soldiers in the aerodrome was bombed, and several casualties observed. The second enemy machine, which was promptly abandoned by the personnel, was bombed and put out of action ; an anti-aircraft gun was directly attacked with bombs ; two bombs were dropped in the middle of camp north-west of the aerodrome. Another body of the enemy was attacked with machine-gun fire from a height of 200 ft., in a camp two miles north of the aerodrome, and two bombs were exploded in the town of El Arish.

"During the operations one of our pilots was forced to descend in the Wadi, two miles north of the enemy aerodrome. His machine was observed to be burning, and it is thought that he set it on fire when he saw that his escape was hopeless. Another pilot, whose aeroplane and engine had been severely hit with shrapnel, reached the coast several miles to the west of El Arish before his engine gave out. He was here discovered by an escorting aeroplane, which landed beside him. The wrecked aeroplane was destroyed by fire, and after several unsuccessful attempts to rise, the rescuing machine finally got off with its pilot and two passengers, and the return journey of ninety miles was made in safety to our base on the Canal."

* * *

Crown Prince Flies.

It is stated by the *Saarbruecken Zeitung* that last week the German Crown Prince had his first flight in the air, and during the 15 mins. he was up passed over the French lines at Verdun. From the adverse criticisms which appear to have been passed upon this excursion, there seem to be plenty in Germany who still consider the Crown Prince's life too precious to risk in this fashion,

A Zeppelin Reported Wrecked.

Reports, said to emanate from Cologne, but which must be accepted with reserve, were received at The Hague on July 20th to the effect that a Zeppelin airship which had carried out a raid over Riga and was hit in several places by Russian anti-aircraft guns, was wrecked near Tukkum. The greater part of the crew was saved. The airship, which was said to be greatly damaged, was taken to pieces by engineers.

Double Fatality in Spain.

It is reported from Madrid that the Spanish military aviators, Capt. Loizu and Lieut. Montoya, have been killed at Tetuan as the result of their biplane taking fire at a great height and crashing to the ground.

Swedish Officer's Inventions.

The Swedish *National Tidende* states that the naval authorities have allowed Lieut. Hasselberg to experiment at the Naval Flying School at Karlskrona with two of his inventions. The first is stated to render possible electric communication between an aviator in flight and the earth, and the second is a contrivance to direct the course of torpedoes from aeroplanes.

A Valuable Scrapbook.

One of the items which attracted considerable attention at the sale of the library of the late A. M. Broadley, last week, was his collection of old cuttings and pictures, comprised in two volumes, relating to aeronautics. This contained, among other curiosities, many quaint and extraordinary old prints, while there was also a series of clippings and photos. recording the progress of the "Bristol" firm. The two volumes, after keen competition, were eventually knocked down for £79.

R.A.F. Employee in Trouble.

At Aldershot Police Court on July 19th, R. F. McDonnell, 33, charge hand in the Royal Aircraft Factory, was charged with the unlawful possession of certain equipment instruments and stores, believed to have been obtained in contravention of Section 156 of the Army Act, 1881. He was also charged under the Public Stores Act, 1875, with the unlawful possession of certain tools, a steel measuring tape, an instrument case, and parts of an aeroplane.

No evidence was taken, as the police superintendent intimated that he had been instructed by the Public Prosecutor to ask for a week's adjournment.

The defendant did not oppose the application, and he was remanded on bail.

A German who is Interested in Aviation.

Ernest Robert Logie Lindner, twenty-one, a German engineer, was at London Sessions, on July 18th, sentenced to four months in the second division for not notifying his change of address, for travelling more than five miles from his residence without a permit, for having military handbooks. and for entering a prohibited area.

Mr. Comyns Carr, prosecuting, said that Lindner got to know officers in a flying school in the north of England. One of the officers had been arrested, and the matter was being investigated by the military. The prisoner had been interned for two days at the beginning of the war, but on the representation of influential friends in Scotland he was released and the Home Office granted him exemption from internment. At the Savoy Hotel he shared a room with an officer. A detective said that only a fortnight ago the prisoner went up in an aeroplane, not at a Government flying ground but at a flying school, which was next door to Government property.

Mr. George Elliott, who defended, said that the prisoner had private means and had three motor cars.

Sir R. Wallace, K.C., said the offence was a very grave one.

Fatal Accidents.

At the inquest on July 20th on Capt. C. W. Reeve and Lieut. W. G. Beatson of the R.F.C., who were killed at Hounslow on the 17th inst., it was stated the machine when at a height of 200 ft. side-slipped through too sharp a turn being made. If the machine had been higher it would have been possible to right it. The petrol tank caught fire, and both officers died from shock and burns.

Flight Sub-Lieut. Douglas Whittier, R.N., was killed in the Isle of Thanet on the 20th inst., his machine falling from a great height.

Also on the 20th inst. a fatal accident occurred in Southampton Water. A seaplane flying low suddenly swerved and caught the main mast of an outward-bound vessel. The mast was broken and the machine crashed to the deck, killing the pilot and so injuring the passenger that he died shortly after.

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A G.A.C. and Emaillite Move.

Having entirely outgrown the accommodation at their West End office, and with a view to centralising their organisation, the General Aeronautical Co., Ltd., and the British Emaillite Co., Ltd., have transferred all their departments, with the exception of that dealing with accounts and executive business, to the works at Willesden. All communications regarding orders and supplies should, therefore, in future be addressed to the companies at 5, Hythe Road, Cumberland Park, Willesden Junction, N.W. The telephone call is Willesden No. 2346. Inquiries relating to accounts or company matters should continue to be addressed to the West End office, 30, Regent Street, S.W., which will continue to be the headquarters of the Directorate.

Buildings for Aeroplane Work.

As there can be no doubt now as to the future of the aeroplane industry, those progressive firms who find it necessary to enlarge their accommodation would do well to erect buildings which will be permanently useful to them for the rapid and economical production of machines. Hy-Rib buildings as used by the Admiralty and War Office may be specially commended in this connection. Such buildings, the makers claim, are fireproof; they can be erected in practically the same time as buildings whose covering is merely black iron sheets, and within 5 per cent. of the latter's initial cost; but whereas black iron sheets are unsightly and require constant maintenance as regards painting, Hy-Rib walls give a clean exterior and bright interior, and require no upkeep expense at all. Hy-Rib walls have been extensively used for every class of military work, from explosive stores to hospital huts. Full particulars as regards details are given in an interesting brochure which may be had from the Trussed Concrete Steel Co., Ltd., 115, Caxton House, Westminster.

Flying at Bournemouth.

Exceptionally fine weather on Wednesday and Saturday last week drew a large crowd to the Bournemouth Aerodrome, and some good flying by Mr. S. Summerfield was seen, including steeply-banked spirals, nose-dives and switch-backing. They also saw a fine piece of unpremeditated air-work on the part of this pilot. He was taking a passenger on the 60 h.p. Caudron, and when at a low altitude the engine wrecked itself, but Mr. Summerfield skilfully brought the machine safely to the ground, and avoided what might have been a serious smash.

On Saturday much interest was taken in the new machine which has been built at the Aerodrome under the supervision of Mr. Summerfield. It closely resembles the Caudron, but one or two modifications, suggested by experience, have been incorporated in the design, which should add to the usefulness of this machine for school work. Mr. Summerfield put her through some satisfactory trial flights.

Wells Aviation Works Excursion.

On Saturday last the staff and workmen of the Wells Aviation Co., Ltd., journeyed by the eight o'clock train to Brighton, and had an enjoyable day by the sea. The weather, which was threatening in the early hours, improved very much during the morning, and the day turned out to be one of the finest of the summer. Luncheon was partaken of about one o'clock, and afterwards two yachts were chartered for the party. No working time was lost as a result of this outing, as the men had worked an extra hour each evening during the preceding week to make up for the morning by the sea. It is interesting to know that all the men returned to work on Sunday morning refreshed and none the worse for the little respite from their arduous labours upon the important work which the firm has in hand.

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THE PUBLISHERS.

EDITORIAL COMMENT.

The R.A.F. Committee Report.

PROBABLY a profound appreciation of human nature was at the bottom of the Government's decision to attach to the criticism and report of the Committee on the Royal Aircraft Factory the criticisms by the Air Board of the criticisms of the Committee on the R.A.F. This sounds a bit involved, but that is only in keeping with the idea of the joint publication of these two reports. By this method, whereby the recommendations of the R.A.F. Parliamentary Committee are traversed and brought into doubt by the Air Board views upon the same subject, no doubt such a confusion will arise in the ordinary lay reader's mind as to the real point at issue, that the main findings and conclusions of the inquiry are in a fair way of being submerged in the sorting out of the divergent opinions as to what should constitute the controlling combination of the Factory in the future. The report, nevertheless, is a big step in the right direction, and on the whole we are inclined to prefer the recommendations of the Business Committee, with Sir Richard Burbidge as chairman, to that put forward by the Air Board. At the same time it is difficult for non-service people to appreciate in its real perspective the necessities and details of administration involved in filling the hour-to-hour calls of those finally responsible to the country for the full and efficient utilisation of the organisation at their disposal. From this point of view, the suggestions of the Air Board as to the constitution of the control of the R.A.F. in the future must be respected. Whatever is actually decided in this connection—and from proceedings in Parliament on Monday it is pretty evident the Government are prepared to pin their faith to the judgment as passed by the Air Board—the country may rest assured that after this shake-up the re-organisation of the Farnborough factory will be based on a very solid foundation of honest endeavour to get the best out of it for the nation.

Taking a broad view of the Committee's report, it is evident that, as was generally conceded, there has been considerable looseness in the organisation and in the carrying out of the functions for which the Factory was orginally created. Upon the latter point there has never been the slightest doubt with those who have followed the history of the Factory. Not only was it clearly indicated in Parliament that the bringing into being of this Department was for the especial purpose of building up a practical experimental shop upon a national scale, but this view has been since, time after time, endorsed both by the War Office and even by those closely associated with the working of the Farnborough establishment. Yet without doubt most of the adverse criticism of the R.A.F. has sprung from the feeling which has unquestionably obtained that, in the background there was the ever-present shadow of a firm intention to ultimately build up a huge Government Aircraft Arsenal, to the glorification of those who might be "in possession," but not necessarily carrying with it such efficiency and economic benefits to the Empire, which wholesome private competitive enterprise ever brings in its wake. Private enterprise always has beaten Government undertakings where free competition has been given, and this will for all time be the same. In the case of the R.A.F., it is abundantly evident that this was a weak point, from the remarks in the report in which attention is drawn to the fact that "the numbers engaged in the Central Office, Stores, and other departments of a non-productive nature, reveal an organisation more liberal than is generally found in Government establishments, and on a scale unknown to us in private works." After allowing for the moderation in language usually associated with committees' reports of this character, this indictment is pretty strong, and, in a way, must be taken to endorse some of the suggestive evidence at the Air Inquiry as to the slackness generally of the establishment. In regard to the entry of the Factory either in the past or in the future into the commercial side of aircraft construction, the report is not very convincing. In the preamble of the Committee's report they say :—

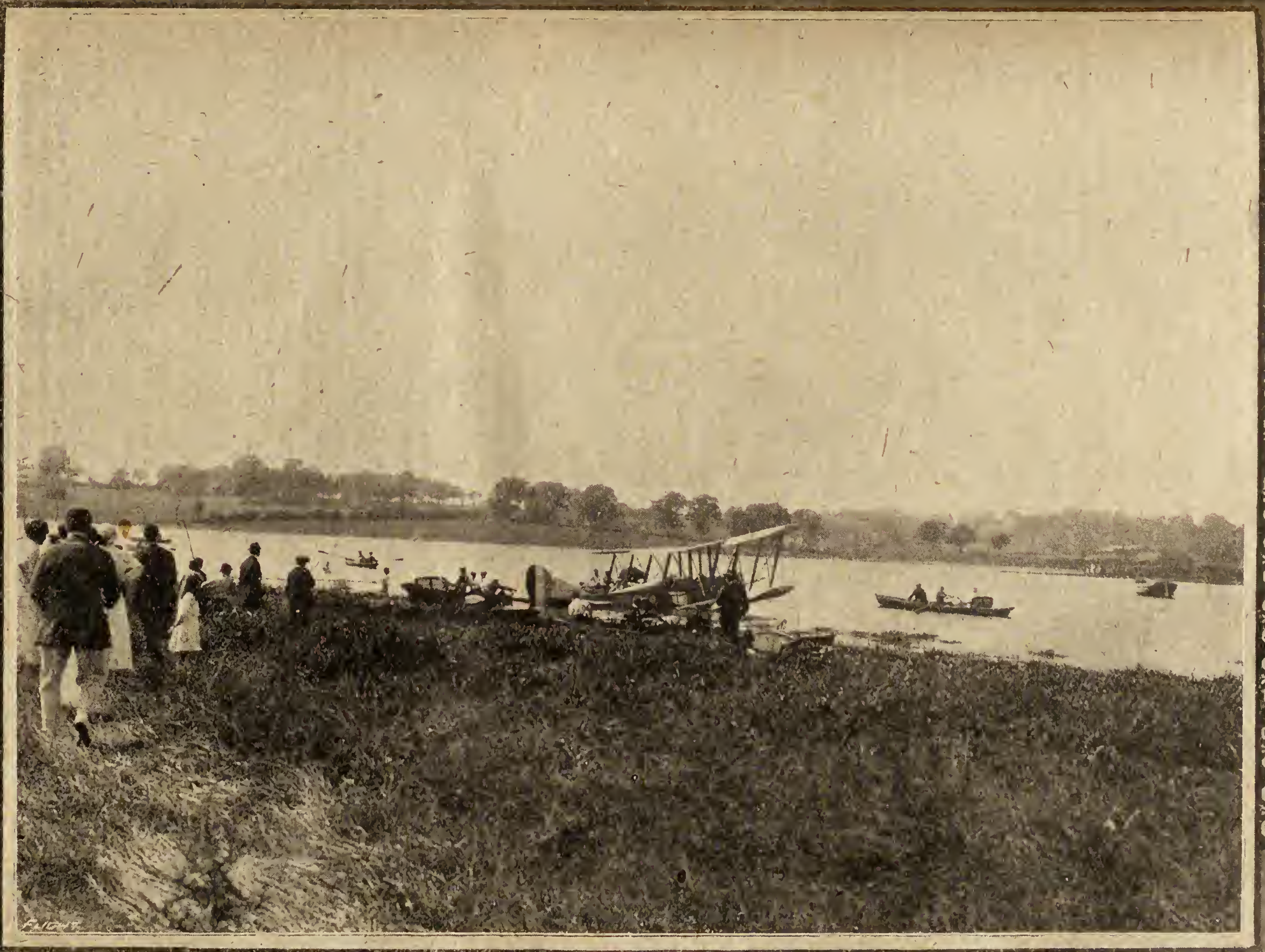
> "The functions of the Royal Aircraft Factory we understand to include original designs of aeroplanes and engines, improvement of existing designs, manufacture of experimental aeroplanes, engines and their parts, and aeronautical devices; study of experimental work in all material used in an aeroplane; preparation of drawings and specifications for contractors, and, in certain cases, supervision of manufacture; repair of aeroplanes and engines, and provision of aeroplane and engine spare parts for maintenance; production of aeroplanes in limited quantity; and emergency work of all kinds to assist contractors or to make good the failure of contractors.
>
> "From which it is apparent that the War Office has laid it down that the Royal Aircraft Factory should be devoted to experimental rather than manufacturing purposes.
>
> "The Royal Aircraft Factory cannot therefore be regarded as an establishment working on strictly commercial lines; it is rather a very large experimental laboratory, probably the largest in the United Kingdom, where experiments are carried out to full scale, therefore expenses must necessarily be high. Experiments upon models to reduced scale are conducted by the National Physical Laboratory as and when required by the Aeronautical Committee or it may be by the Royal Aircraft Factory."

Now all this is perfectly straightforward and endorses all that has been said as to the legitimate functions of the Factory under its original "Charter," especially when in the next paragraph it is noted that "the only manufactured work done since the war began seems to have been an output of about 50 non-experimental machines and the manufacture of spare parts to meet urgent demands." How these facts and views can be reconciled, however, with the percentages given of the total amounts absorbed by the various classes of work carried out in the R.A.F. is a mystery. These allot to "experimental work, including about £5,000 on indirect expenditure," 22 per cent. of the cash expended, whilst the "construction of aeroplanes" has accorded to it 35 per cent. It is obvious that something must be wrong here, or else the "remarks" of the Committee must be very seriously re-edited. Here apparently arises another difference of opinion between the Committee and the Air Board, as the latter fall foul of these percentages and claim that the 35 per cent. includes "new experimental, construction, &c., services," and not "construction of aeroplanes." The proportion of actual construction is put by the Air Board as at "probably less than 10 per cent." We agree with the Board that "this is a misapprehension which it appears very desirable to correct." But what appeals to us is how do these extraordinary differences in matters of *fact* come about. That there is still room for discussion and investigation is further suggested by the fact that the Board again are in direct conflict with the Committee even upon the actual constitution of the organisation as at present in operation! Is all this due to too hurried an inquiry by the Committee and a sort of accepting everything as presented by the staff all cut and dried for digestion, or is it due to the want of the necessary technical knowledge by those entrusted with the investigation? Either alternative is highly unsatisfactory to those who hoped to see a sound, frank and well-considered *résumé* of the pros and cons of the administration of the R.A.F.

One of the most recurring sources of irritation amongst the Trade—the numerous alterations after the issue of manufacturing drawings and the absolute errors in drawings—is very emphatically nailed down as being rampant in connection with the aeroplane contracts given out. We might add that wrong figures and dimensions might well have been also added to "errors in drawings." In the "conclusions" of the Committee, after expressing the strong opinion as to the desirability of such an experimental establishment as the R.A.F., the Committee state that :—

> "The existing undesirable trade feeling referred to we consider should be met and, if possible, overcome, as its existence can hardly fail to have a detrimental effect on all concerned. We do not consider that the competition of the Royal Aircraft Factory with the trade should, if reasonably administered, be the cause of any detrimental friction or trade feeling."

With this latter conclusion we are, as we have already, and for all time in the past, stated, entirely at variance. What "reasonably administered" means exactly it would not be easy to define, but we can imagine nothing more unlikely than that the "reason" could possibly bear the same interpretation from both sides. As in the past, nothing can regulate prices, quality, invention, initiative and enterprise more than keen commercial competitive construction. It is good for everybody, and not least for the Exchequer. By this means the finest brains are attracted to the industry and, moreover, obtain good value for their goods, and thereby progress is maintained which is calculated to keep this country well ahead in air supremacy. Give over the manufacturing side to a Government official and



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AN AMPHIBIAN BIPLANE.—Owing to the shedding of a landing wheel when getting away at Hendon on Sunday last, the pilot of a reconnaissance machine chose the lesser of two evils, and brought his mount safely to rest in the Brent Reservoir. Pilot and passenger escaped with what was a welcome ducking, the day being extremely hot, and the machine was towed safely to the side, practically undamaged.

at once cobwebs begin to be woven over the whole Department, until we should find ourselves a decade or two behind our neighbours, who in the meantime have been preparing for "Tags" of their own in various hemispheres, not calculated to enhance the prosperity of the British Empire, No, let the R.A.F. stick to its original "charter," the prosecuting of practical experiments, and, as we have had occasion to point out consistently in past years, it will have all its work cut out to keep this country to the front in the science of the air, and the present "shops" will be found before very long all too small to even do this efficiently. One suggestion of the Committee, which bears upon the same subject, is distinctly sound in principle, and is to the effect that Government financial assistance, if necessary, should be given to the Trade for the purpose of enhancing the supply of higher-powered engines. This is a practical move in the right direction and far ahead of any scheme to entangle the Factory itself in manufacturing meshes, although, of course, the question of scarcity of skilled mechanics just now is the crux of the whole situation. Already in other directions in the Aeronautical Industry the financial assistance of the Government *has* brought about immediate and most valuable results, and the plunge thus taken should be but a beginning and an indication of the intention generally, in this and other industries, of the Government to help forward the trade of the Empire, so that, irrespective of whatever restrictions are placed upon German trading ramifications in the future, our people shall, by proper backing, be enabled to establish after the war the trade of the Empire upon a footing and a magnitude undreamt of even by the most sanguine believer in Britain's greatness.

The Air Board also rather indicate that they not averse to the introduction of constructio part of the Factory's scope, which view we shall to see revised before long, especially as they are emphatic upon the question of the experime side. They say "no reduction should be mad the amount of experiment conducted at the Fact On the contrary, this is the aspect of their work w it is desirable to emphasise by every possible mea By confining the entire energies of the establishm in the future to this, the Factory's legitim *raison d'être* of existence, the Board is not only, as have said, sure of obtaining the best guarantee our progress in air navigation, but they will with stroke obtain the full confidence and most hel co-operation of the entire trade in the great w which is in front of the aeronautical industry.

With the concluding remark of the Air Board the effect that "any measures of reorganisation the R.A.F. should be adopted with the concurre of the Air Board," we leave this subject for present, with the conviction that at least the res will be an honest and clean attempt to promote highest ideals for an unfettered Air Service. F to this end, the Air Board, sooner or later, w require and must be accorded much more extend powers than at present it possesses. The time an Air Minister may possibly not have arrived y but it cannot be very far off, and in the meantin all must unite in making the best of the prese compromise, which is leading to the placing Aviation in its proper sphere. After all, it is as y but young to have accomplished what it has, an the wonder is that it has not been at a far great cost than its most virulent critic can saddle with.

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THE "X" AIRCRAFT RAIDS.

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces :—

"X 39" Raid, July 29th.

July 29th, 2.35 *a.m.*

"German airships raided the East Coast early this morning.

"The number of the raiders has not yet been established.

"Reports as to the raiders crossing our coast have come in from Yorkshire and Lincolnshire.

"Bombs were stated to have been dropped, but details are as yet lacking."

July 29th, 1.30 *p.m.*

"Three airships raided the East Coast between midnight and 1.30 a.m.

"Thirty-two bombs were dropped in Lincolnshire and Norfolk, but no material damage and no casualties were caused. Many other bombs are reported to have fallen into the sea.

"At one place anti-aircraft guns were in action, and succeeded in driving off the aircraft from their objective.

"The raiders appear to have been greatly hampered by fog."

German Version. *Berlin, July 29th.*

"On the night of the 28th inst. a naval airship squadron attacked the English East Coast, dropping bombs on the railway depôt at Lincoln and industrial establishments near Norwich, the naval bases of Grimsby and Immingham, and on the advance-post vessels off the Humber. The lighthouse at the mouth of the Humber was destroyed. Despite the fact that the airships were fired at with incendiary projectiles, they all returned undamaged to their harbours.—Signed, Chief of the Naval Staff."

The Press Bureau appends the following note :—

"*The German report of the air raid of the night of July 28th–29th is full of the usual inaccuracies.*"

"X 40" Raid, July 31st. *August 1st*, 12.45 *a.m.*

"An attack by a number of hostile airships develop before midnight last night. The raiders were reported crossing our coast line along the eastern and south-eastern countie Bombs were dropped off the Thames estuary. The attack proceeding."

August 1st, 2.15 *a.m.*

"To-night's raid appears to have been carried out by considerable number of airships. The raiders appear to hav spent some time cruising over the counties of Lincoln, Norfolk Suffolk, Cambridge, Essex, Kent, and Huntingdon. Bomb were dropped somewhat indiscriminately over localitie possessing no military importance. At one spot anti-aircra guns came into action, it is believed with good effect. Ful details of the raid are not yet to hand."

3.50 *p.m.*

"Last night, between the hours of 10 p.m. and midnight our Eastern and South-Eastern Counties were attacked by several hostile airships.

"The raiders flew at a great height. Owing to this fact and to patches of mist, the airships' movements gave rise to much uncertainty, and their number was difficult to determine. At least six ships could be reckoned by independent observers, and it is probable that one more flew over the country without dropping bombs.

"The number of bombs was at first greatly exaggerated owing to the majority of them falling in thinly inhabited districts, and having been heard at great distances. The actual number found up to date is about 60.

"One raider was engaged by aircraft and anti aircraft guns. She was seen to drop to a low altitude, and disappeared in the mist."

5.5 *p.m.*

"The reports received to-day show that no casualties of any sort were caused by last night's air raid."

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared among the Admiralty announcements of July 25th :—

Acting Lieutenant (R.M.) : G. E. Wildman-Lushington, appointed Probationary Flight Sub-Lieutenant (temporary), seniority July 22nd, and appointed to "President," additional, for R.N.A.S.

Sub-Lieutenant (temporary, R.N.V.R.) : B. M. Dodds, promoted to Lieutenant (temporary), seniority July 21st.

The following temporary commissions have been granted (R.N.V.R.) : Lieutenant : A. T. Evans, C. E. Stent, H. R. C. Adams, A. H. White, L. S. M. Pyke, all seniority July 24th. Sub-Lieutenants : L. F. Binns, seniority July 22nd ; N. W. Hughes and H. G. W. Cox, both seniority July 24th.

The following appeared among the Admiralty announcements of July 27th :—

Sub-Lieutenant (temporary, R.N.V.R.) : V. S. Wright, appointed Probationary Flight Sub-Lieutenant (temporary), seniority July 30th, and appointed to "President," additional, for R.N.A.S.

Petty Officer (Mechanic) : R. M. Catterson-Smith, granted a temporary commission as Sub-Lieutenant (R.N.V.R.), seniority July 24th, and appointed to "President," additional, for R.N.A.S.

The following appeared in the *London Gazette* of July 28th :—

The following promotions have been made :—

Wing-Commanders to be Wing-Captains.—E. A. D. Masterman, E. M. Maitland, E. L. Gerrard, C. L. Lambe ; June 30th, 1916.

Squadron-Commanders to be Wing-Commanders.—C. M. Waterlow, J. W. Seddon, J. C. Porte ; June 30th, 1916.

Flight-Commanders to be Squadron-Commanders.—D. H. Hyde-Thomson, A. J. Miley, W. C. Hicks, E. Osmond, I. H. W. S. Dalrymple-Clark (Acting Squadron-Commander), R. J. Bone, D.S.O., C. H. K. Edmonds, D.S.O., I. G. V. Fowler, H. M. Cave-Brown-Cave, A. D. Cunningham, R. E. C. Peirse, D.S.O., J. R. W. Smyth-Pigott, D.S.O. (Acting Squadron-Commander), P. F. M. Fellowes ; June 30th, 1916.

Flight-Lieutenants to be Flight-Commanders.—E. B. Beauman, N. B. Tomlinson, C. W. H. Pulford, P. L. Holmes, E. R. Whitehouse, H. Stewart, A. R. Arnold, N. S. Douglas, G. B. Dacre, D.S.O., R. J. J. Hope-Vere (Acting Flight-Commander), R. Whitehead, V. G. Blackburn, D.S.C., G. L. Thomson, D.S.C., I. H. B. Hartford, G. C. Colmore (Acting Flight-Commander), A. K. Robertson (temporary service), B. F. Fowler (temporary service), D. Harries, G. H. Scott, R. E. Nicoll, K. S. Savory, D.S.O., T. H. England, V. Nicholl, D.S.C., B. L. Huskisson, J. J. Petre, E. H. Dunning, D.S.C., H. F. Towler ; June 30th, 1916.

Flight Sub-Lieutenants to be Flight-Lieutenants.—F. J. Bailey, L. H. F. Irving, R. G. Mack, W. F. Horner, A. W. Mylne, R. A. Cochrane, R. S. Booth, G. M. Thomas, C. J. Galpin, J. G. Struthers (temporary service), R. S. Smith, E. A. de Lossy de Ville (temporary service), G. A. Cox, S. St. G. C. Belfield (temporary service), C. L. Scott, E. J. P.

A POPULAR R.N.A.S. OFFICER.—At the wedding last week of Flight Sub-Lieut. MacMinnies and Miss L. Kermode at St. Anne's Church, Eastbourne. A batch of air-mechanics hauling along the carriage, containing the bride and bridegroom.

Burling, H. C. Vereker, J. B. Cole-Hamilton, E. P. Hardman (temporary service), S. R. Watkins (temporary service), J. A. Goodwin, G. G. G. Hodge, C. F. Latimer, S. B. Joyce, C. R. Blagrove (temporary service), G. G. Ommanney, H. de V. Leigh, H. S. Bompas (temporary service), L. C. Keeble, H. A. Bower, J. D. Hume (temporary service), P. Roach-Pierson, V. Nicholson (temporary service) (since killed), N. W. G. Blackburn (temporary service), C. C. Wyllie (temporary service), H. K. Thorold, D.S.C., H. S. Neville (temporary service), E. W. Norton, E. Cadbury, J. H. D. Grant (temporary service), M. H. Spencer (temporary service), E. M. Pizey (temporary service), S. Bell (temporary service), B. C. Clayton, J. E. Minific (temporary service), R. S. Dallas (temporary service), A. D. W. Allen (temporary service), C. R. Mackenzie (temporary service), F. U. Y. Weldon (temporary service), C. MacLaurin (temporary service), C. T. Freeman (temporary service), J. A. Carr (temporary service), C. B. Gasson (temporary service), P. A. Johnston (temporary service), A. T. N. Cowley (temporary service), G. V. Leather (temporary service), C. H. Hayward (temporary service), J. H. Vickers (temporary service), B. C. Tooke; June 30th, 1916.

The following appeared among the Admiralty announcements of July 28th :—

The following promotions have been made to date June 30th :—

Wing-Commanders to be Acting Wing-Captains.—W. L. Elder and R. M. Groves, D.S.O.

Squadron-Commanders to be Acting Wing-Commanders.—G. W. S. Aldwell, E. T. R. Chambers, and W. Briggs.

Flight-Commanders to be Acting Squadron-Commanders.—E. H. Sparling, G. R. Bromet, and H. R. Busteed.

Flight-Lieutenants to be Acting Flight-Commanders.—J. Bird and R. B. B. Colmore.

Warrant Officers II. to be Warrant Officers I.—W. A. Hancock, C. F. Rasmusen, and G. Bowen.

Chief Petty Officers, 1st Class, to be Warrant Officers II.—H. Bradford, H. P. Leigh, W. H. Jinman, and H. Satterford.

Chief Petty Officer, 2nd Class, to be Warrant Officer II.—W. G. Kentfield.

Engineer-Capt. (retired) R. K. Herbert to "President," additional, for duties in connection with R.N.A.S. recruiting, July 27th.

The undermentioned have been entered as Probationary Flight Sub-Lieutenants for temporary service and appointed to the "President," additional for R.N.A.S., all to date July 30th; J. Gamon, A. W. Kay, C. F. Brewerton, H. F. Delarue, E. H. Snell, G. L. Elliott, E. A. H. Birch, A. Adamson, B. R. Millar, A. L. Rimer, B. H. Bridge, E. W. Unmack, T. S. S. Hood, J. E. Rushbrooke, R. S. Freeman, M. C. Radford, T. A. Gladstone, P. C. Wood, E. Dickson, A. V. Lewis, N. C. Watt, also R. V. Knight; August 6th.

H. Slaney and W. L. Amos have been granted temporary commissions as Sub-Lieutenants, R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to date July 27th.

The following appeared among the Admiralty announcements of July 31st :—

Temporary Probationary Flight Sub-Lieut. R. J. E. S. Dawson granted a temporary commission as Sub-Lieutenant, R.N.V.R., with seniority August 6th.

Royal Flying Corps (Military Wing).

THE following appeared in a supplement to the *London Gazette* issued on July 24th :—

Equipment Officers.—Lieut. E. Powell, Special Reserves, from Assistant Equipment Officer, and to be Temporary Captain whilst so employed; May 6th, 1916. Capt. G. Adams, S. Lancs. Regt., and to be seconded; May 27th, 1916.

Supplementary to Regular Corps.—Stanley Morris to be Second. Lieut.; July 7th, 1916.

The following appeared in the *London Gazette* of July 25th :—

Wing Commanders (from Squadron Commanders, and to be Temporary Lieutenant-Colonels whilst so employed).—Capt. (Temporary Major) U. J. D. Bourke, Oxford and Bucks L.I., vice Capt. (Temporary Lieut.-Col.) A. C. H. MacLean, R. Scots; June 18th, 1916. Capt. (Temporary Major) W. R. Freeman, Manch. R.; July 5th, 1916.

Depôt Commander.—Major A. D. Carden, R.E., from a Park Commander, and to be Temporary Lieutenant-Colonel whilst so employed; May 31st, 1916.

Squadron Commander.—Temporary Capt. the Hon. A. S. Byng, General List, from a Flight Commander, and to be Temporary Major whilst so employed; July 5th, 1916.

Park Commanders.—Capt. (Temporary Major) R. Orme, Special Reserve, from a Squadron Commander, and to retain his temporary rank whilst so employed; May 10th, 1916. From Equipment Officers, and to be Temporary Majors whilst so employed.—Temporary Capt. H. Burchell, Special Reserve; May 31st, 1916. Lieut. (Temporary Capt.) N. Goldsmith, R.A.; July 6th, 1916.

Flight Commanders.—June 1st, 1916: Capt. R. Blatherwick, R. Sc. Fus., Special Reserve, from a Flying Officer. From Flying Officers, and to be Temporary Captains whilst so employed: Lieut. J. P. Inglefield, Special Reserve; Lieut. A. A. A. Knight, R. Muns. Fus.; Second Lieut. R. K. Shives, Special Reserve; Second Lieut. B. H. Radford, Special Reserve, from a Balloon Officer, and to be Temporary Captain whilst so employed; June 9th, 1916. Lieut. O. T. Boyd, 5th Cav., Ind. Army, from a Flying Officer, and to be Temporary Captain whilst so employed; July 9th, 1916.

Flying Officers (Observers).—July 7th, 1916: Second Lieut. F. A. Hunter, R.F.A., Special Reserve; Temporary Second Lieut. W. S. Joel, Bord. R., and to be transferred to the General List; Temporary Second Lieut. P. T. Carden, General List; Temporary Second Lieut. N. B. Harris, General List.

Assistant Equipment Officers.—Second Lieut. K. Arnold, Special Reserve; May 29th, 1916. Second Lieut. B. R. S. Jones, S. Wales Bord., Special Reserve, and to be seconded; June 22nd, 1916.

Memoranda.—To be Temporary Second Lieutenants for duty with Royal Flying Corps: Corp. (Cadet) Benjamin Soutten, from R. Fus.; July 8th, 1916. July 10th, 1916: Cadet Graham S. Steel, Pte. Ralph C. Fielder, from H.A.C. (T.F.).

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: J. M. Drysdale, P. Adams, H. A. Browne, P. M. T. Hill.

Kenneth Arnold to be Second Lieutenant; May 29th, 1916.

To be Second Lieutenants (on probation): Thomas G. Leith; July 1st, 1916. Antoine E. Verpilleux; July 4th, 1916. Thomas McC. Yarwood; July 7th, 1916. Franklin E. Pike; July 10th, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 26th :—

Flight Commanders.—From Flying Officers, and to be Temporary Captains whilst so employed: Lieut. R. G. Gould, Special Reserve; June 20th, 1916. Lieut. D. B. Richardson, Welsh Divl. Engrs., R.E. (T.F.); June 22nd, 1916. July 7th, 1916: Temporary Lieut. A. H. Smith, General List; Lieut. E. R. Valsey, Essex R. (since deceased). Second Lieut. A. W. C. V. Parr, Rif. Brig.; July 8th, 1916.

Flying Officers.—Second Lieut. F. H. Stone, Special Reserve; July 5th, 1916. Temporary Lieut. G. W. N. R. Haynes, R. Muns. Fus., and to be transferred to the General List; Temporary Second Lieut. C. C. Hayward, Rif. Brig., and to be transferred to the General List; Second Lieut. G. H. Russell, Notts and Derby R., and to be seconded; July 6th, 1916: Second Lieut. (Temporary Lieut.) H. W. Stafford, Lan. Fort Engrs., R.E. (T.F.); Second Lieut. (Temporary Lieut.) L. C. Pockney, N. Midland Brig., R.F.A. (T.F.); Lieut. E. V. C. Hamilton, Worc. R., and to be seconded; Temporary Lieut. J. B. Quested, A.S.C., and to be transferred to the General List; Temporary Second Lieut. F. D. Jackson, Lan. Fus., and to be transferred to the General List; Temporary Second Lieut. L. C. Drenon, General List, from a Flying Officer (Observer); Second Lieut. H. M. B. Law, Special Reserve; Second Lieut. H. D. Crompton, Special Reserve; Temporary Second Lieut. P. W. Chambers, General List; Temporary Second Lieut. H. C. Todd, General List; Second Lieut. C. W. Carleton, Special Reserve; Temporary Second Lieut. T. W. Jay, General List; Second Lieut. C. A. R. Shum, Special Reserve; Second Lieut. P. W. Snell, Special Reserve; Second Lieut. J. K. Tullis, R.F.A. (T.F.); Second Lieut. C. R. Young, Special Reserve; Second Lieut. F. B. Baragar, Special Reserve; Second Lieut. W. E. L. Seward, Special Reserve; Second Lieut. G. R. Travis, Special Reserve; Second Lieut. W. L. Hay, Special Reserve; Second Lieut. E. E. E. Pope, Special Reserve. July 7th, 1916: Temporary Lieut. S. B. Smith, S. Staff. R., and to be transferred to the General List; Lieut. T. L. Mallory, Lan. Fus., Special Reserve, and to be seconded; Temporary Second Lieut. H. E. Bagot, R.F.A., and to be transferred to the General List; Second Lieut. G. S. Rogers, Special Reserve; Temporary Second Lieut. E. J. Garland, General List; Second Lieut. H. M. Massey, Notts and Derby R., and to be seconded; Second Lieutenant W. S. FitzR. Saundby, York.

R., and to be seconded; Second Lieut. F. H. B. Selous, R. W. Surr. R., and to be seconded; July 9th, 1916. July 10th, 1916: Lieut. N. F. Anderson, Canadian A.S.C.; Second Lieut. M. M. Sisley, Special Reserve; Temporary Second Lieut. E. A. Pope, General List. July 11th, 1916: Lieut. E. G. Roberts, Australian Flying Corps; Temporary Second Lieut. C. M. Kelly, L'pool R., and to be transferred to the General List; Temporary Secood Lieut. J. H. Gale, General List; Second Lieut. J. M. Drysdale, Special Reserve.

Flying Officer (Observer).—Temporary Second Lieut. S. Wilkins, General List; July 11th, 1916.

Balloon Officers.—July 10th, 1916: Lieut. E. F. Campbell, K.R.R.C., and to be seconded; Temporary Second Lieut. D. C. Rowlett, N. Staff. R., and to be transferred to the General List; Second Lieut. J. W. Bradford, York. R. (T.F.); Temporary Second Lieut. H. P. Jenkinson, R.F.A., and to be transferred to the General List; Second Lieut. T. H. J. Wright, Sea. Highrs., and to be seconded; Temporary Second Lieut. R. B. Wann, R. W. Kent R., and to be transferred to the General List; Second Lieut. H. H. Burt, Special Reserve; Second Lieut. J. Mitchell, Special Reserve.

Assistant Equipment Officers.—Second Lieutenants, Special Reserve: W. Yonge; May 27th, 1916. R. H. Whittington; June 11th, 1916. June 12th, 1916: J. J. Botterill, T. McI. MacKay. S. H. Hawes; June 13th, 1916. P. Adams; June 22nd, 1916. June 23rd, 1916: H. A. Browne, E. E. G. B. Lennard, J. L. Luntley; June 24th, 1916. Temporary Second Lieut. S. R. Axford, General List; June 25th, 1916. Temporary Second Lieut. H. B. Wakefield, General List; June 28th, 1916. June 30th, 1916: Lieut. V. O. Rees, Lond. R. (T.F.), Second Lieut. P. M. T. Hill, Special Reserve. July 5th, 1916: Second Lieut. L. S. Dell, R.F.A., Second Lieut. G. R. Nicholson, Special Reserve. Second Lieut. S. Morris, Special Reserve; July 10th, 1916.

Memoranda.—2nd Class Air-Mechanic Raymond Grant Fraser, from Royal Flying Corps, to be Temporary Second Lieut. for duty with the Military Wing of that Corps; July 5th, 1916.

Pte. Lachlan Macdonald, from Inns of Court O.T.C., to be Temporary Second Lieut. for duty with the Royal Flying Corps; July 7th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: W. E. L. Seward, G. R. Travis, H. H. Burt, R. H. Whittington, T. McI. Mackay, J. J. Botterill, W. L. Hay, S. H. Hawes.

Wilfred Yonge to be Second Lieutenant; May 27th, 1916.

To be Second Lieutenants (on probation): Sydney A. Harding; June 14th, 1916. Frederick C. Thomas; June 16th, 1916. Robert W. Reid; July 15th, 1916.

The following appeared in a supplement to the *London Gazette*, issued on July 27th:—

Park Commander.—Maj. A. F. S. Leggatt, R. Scots, from Adjutant; June 26th, 1916.

Flight Commander.—Second Lieut. E. B. Broughton, Special Reserves, from a Balloon Officer, and to be temporary Captain whilst so employed; July 5th, 1916. From Flying Officers and to be temporary Captains whilst so employed: Second Lieut. F. J. H. Thayre, Special Reserves; July 10th, 1916. Lieut. W. E. F. Davidson, E. York. Regt., Special Reserves; July 12th, 1916.

Flying Officer.—Temporary Second Lieut. E. M. Chamberlain, General List; September 7th, 1915.

Memoranda.—To be temporary Second Lieuts. (on probation) for duty with R.F.C., July 7th, 1916: W. H. N. Shakespeare, J. W. Somers, R. Turnell, W. D. Patrick, all from No. 9 Officer Cadet Bn.; H. J. Green, No. 4 C.B.; J. H. R. Sutherland, No. 7 C.B.; H. V. James, No 6 O.C.B.; A. R. Johnston, No. 4 O.C.B.; W. D. G. Lotan, No. 9 O.C.B.; C. J. Thompson, No. 9 O.C.B.; N. G. Arnold, No. 7 O.C.B.; J. H. Cross, No. 9 O.C.B. E. V. Gibson, No. 6. O.C.B.; J. Wood, No. 4 O.C.B.; E. T. Dunford, No. 7 O.C.B.; J. B. Pierce, No. 4 O.C.B.; F. Fenwick, No. 9 O.C.B.; H. D. Higham, No. 7 O.C.B.; J. Hodder, No. 9 O.C.B.; G. O. Maugham, No. 4. O.C.B.; R. D. Baker, No. 7 O.C.B.; A. S. Carey, Inns of C. O.T.C.; J. V. Lyle, No. 9 O.C.B.; J. Whyte, No. 9 O.C.B.; E. P. Wilton, No. 9 O.C.B.; A. L. Baker, No. 3 O.C.B.; D. E. Davies, No. 2 O.C.B.; W. F. H. Fullerton, No. 7 O.C.B.; W. G. Foulds, No. 9 O.C.B.; H. E. Rahtkens, No. 6 O.C.B.; R. Turner, No. 9 O.C.B.; C. A. Brown, Second Artists Rifles, O.T.C.; A. H. Hodgson, No. 4 O.C.B.; L. I. Barker, Second Artists' Rifles O.T.C.; H. Gammon, Inns of C. O.T.C.; C. Emery, No. 6. O.C.B.; W. Jordan, No. 4 O.C.B.; E. W. Lamont, No. 6 O.C.B.; A. P. Davies, No. 4 O.C.B.; C. B. Holland, No. 6 O.C.B.; C. F. Crapp, No. 4 O.C.B.; W. S. Morrison, No. 6 O.C.B.; J. W. Foreman, No. 9 O.C.B.; J. H. Gotch, No. 7 O.C.B.; H. C. Head-Jenner, No. 4 O.C.B.; J. S. Trelease, No. 9 O.C.B.; R. B. Corfield, No. 4 O.C.B.; D. C. Ellis, No 6. O.C.B.; F. J. Taylor, No. 3 O.C.B.; A. R. Frier, No. 2 O.C.B.; A. Morrison, No. 4 O.C.B.; J. O. Barnett, Inns of C. O.T.C.; A. Lindley, No. 4 O.C.B.; H. E. Arnold, No. 2 O.C.B.; F. E. Smyth, No. 9 O.C.B.; R. M. Swyer, No. 2 O.C.B.; A. C. Wyness, No. 3 O.C.B.; J. Fleming, No. 3 O.C.B.; H. J. Howell, No. 4 O.C.B.; F. R. Maugham, No. 4 O.C.B.; S. O. Smith, No. 4 O.C.B.; J. F. Guinan, No. 4 O.C.B.; R. E. J. Fulljames, Inns of C. O.T.C.; D. H. Robertson, No. 4 O.C.B.; G. M. Underwood, No. 9 O.C.B.; W. G. Holbrow, No. 3 O.C.B.; E. W. A. Hunt, No. 6 O.C.B.; F. H. Wilson, No. 3 O.C.B.; V. M. Fallowfield-Cooper, Inns of C. O.T.C.; W. M. Groom, No. 4 O.C.B.; F. V. Kelway, No. 3 O.C.B.; C. D. Smart, No. 4 O.C.B.; J. J. Tindal, No. 9 O.C.B.; F. H. Austin, Inns of C. O.T.C.; T. H. G. Chaplin, No. 3 O.C.B.; C. R. H. Jackson, Inns of C. O.T.C.; G. F. Mackay, No. 7 O.C.B.; C. H. Smith, No. 4 O.C.B.; G. S. Thwaits, No. 4 O.C.B.; J. A. Vessey, No. 2 O.C.B.; C. P. Williams, No. 3 O.C.B.; F. Collard, No. 9 O.C.B.; H. Matthews, No. 10 O.C.B.; G. H. Bennett, No. 6 O.C.B.; E. W. Ridgway, No. 4 O.C.B.; W. A. G. Young, Second Artists Rifles, O.T.C.; J. E. Lewis, No. 6 O.C.B.; D. E. Greenhow, No. 3 O.C.B.; E. T. Collins, Inns of C. O.T.C.; W. J. Thuell, Second Artists Rifles O.T.C.; G. F. Turberville, Inns of C. O.T.C.; J. Muirhead, Inns of C. O.T.C.; H. J. Bailey, No. 3 O.C.B.; G. Eastwood, No. 2 O.C.B.; A. V. Griggs, No. 3 O.C.B.; H. Bowker, No. 3 O.C.B.; H. M. S. Church, No. 2 O.C.B.; J. S. Morison, Inns of C. O.T.C.; C. F. Matthew, No. 4 O.C.B.

Supplementary to Regular Corps.—Second Lieut. N. S. Percival resigns his commission; July 28th, 1916.

Second Lieut. (on probation) N. G. Caridia is confirmed in his rank.

To be Second Lieuts. (on probation): William A. Verner-Furlong, June 21st, 1916. July 7th, 1916: Eric Rivers-Smith, Howard Straker, Frederick H. Jones, Joseph A. Chown, Edgar M. Howes, Arthur B. Albert, Oskar Lindquist, Edward S. Cohen, Allison H. Meldrum, Thomas E. H. Bristow, Harold R. Bruty, Alfred C. Blackmore, Hubert Darnell, Claude A. Cuthbert, Leonard F. Bennett.

The following appeared in the *London Gazette* of July 28th:—

Staff Officers, 1st Class.—July 6th, 1916: Graded for pay as A.A.Gs.—From Brigade Majors, and to be temporary Lieutenant Colonels whilst so employed; Lieut. (temporary Capt.) C. F. Lee, W. Som. Yeo., T.F.; Capt. G. Livingstone, London R., T.F.

Staff Officers, 2nd *Class.*—July 6th, 1916: Graded for pay as Brigade-Majors—From Staff Captains.—Lieut (temporary Capt.) A. J. S. Scott, Suss. Yeo., T.F. Temporary Second Lieut. (temporary Capt.) J. B. Solomon, Oxf. and Bucks, L.I.

Staff Officer, 3rd Class (graded for pay as a Staff Captain).—G. D. Pidgeon, Special Reserves, from an Assistant Equipment Officer, and to be temporary Captain whilst so employed, July 6th, 1916.

Squadron Commanders.—July 1st, 1916: Maj. C. Mellor, R.E., from a Flight Commander. From Flight Commanders, and to be temporary Majors whilst so employed; Capt. M. W. Noel, Liverpool R.; Capt. R. E. Lewis, W. Ind. R.; Capt. Lord G. Wellesley, G. Gds.; Capt. D. L. Allen, R. Ir. Fus.; Temp. Capt. C. S. Wynne-Eyton, Gen. List.; Lieut. (temporary Capt.) E. P. Graves, R.A.; Lieut. (temporary Capt.) A. A. B. Thomson, R. War. R.

Equipment Officers.—May 27th, 1916: Temporary Capt. C. M. Smith, General List, and to relinquish the rank of Temporary Major; Temporary Lieut. R. H. Brand, General List, and to be Temporary Captain whilst so employed.

Flying Officers.—July 12th, 1916: Temporary Second Lieut. (Temporary Lieut.) H. M. Whitehead, Oxf. and Bucks. L.I., and to be transferred to the General List; Temporary Second Lieut. R. T. Percival, Oxf. and Bucks. L.I., and to be transferred to the General List; Second Lieut. N. G. Caridia, Special Reserve.

Memoranda.—The undermentioned Warrant and Non-Commissioned Officers to be Temporary Second Lieutenants (on probation): Corp. G. E. Maxwell, from R.E., for duty with R.F.C.; May 20th, 1916. June 26th, 1916: Petty Officer W. B. South, from R.N.A.S., for duty with the R.F.C.; Sergt. T. E. Drowley, from R.F.C., for duty with the R.F.C. July 2nd, 1916: Sergt. C. K. Shepherd, from R.F.C., for duty with the R.F.C.; Sergt. P. S. Williams, from R.F.C., for duty with the R.F.C.

The undermentioned, from R.F.C., to be Temporary Second Lieutenants for duty with the Military Wing of that Corps: Flight-Sergt. H. D. Davis; July 4th, 1916. Second Class Air-Mechanic A. E. Biscoe; July 17th, 1916. The undermentioned to be Temporary Second Lieutenants, for duty with R.F.C., July 22nd, 1916: Sergt. T. S. Edelston, from R. Fus.; Corp. D. G. Harrison, from R.E.; Corp. E. D. Howard, from Inns of Court O.T.C.; Pioneer G. C. Stead, from R.E. (T.F.); Cadet E. F. Loomes, from R.A. Cadet School; Pte. C. V. de Burgh Rogers, from Inns of Court O.T.C.; Pte. B. A. Taylor, from Inns of Court O.T.C.; Pte. M. P. Henderson, from Gord. Highrs. (T.F.); Pte. J. N. Pallister, from A.S.C.; Pte. T. Webb, from Lond. R. (T.F.); Pte. H. G. Spearpoint, from Northd. (Hrs.) Yeo. (T.F.).

Supplementary to Regular Corps.—P. G. Emery to be Second Lieutenant (on probation); July 1st, 1916.

The following appeared in a supplement to the *London Gazette* issued on July 29th:—

Flight-Commanders (from Flying Officers).—Lieut. C. O. Fairbairn, N. Lan. R., Special Reserve, and to be Temporary Captain whilst so employed; April 1st, 1916. July 1st, 1916: Capt. C. H. Saunders, Special Reserve; Capt. M. G. F. Richardson, Northd. Fus. (T.F.). *And to be Temporary Captains whilst so employed:* Lieut. J. B. Elliott, Rif. Brig., Special Reserve; Temporary Lieut. W. E. G. Murray, General List; Lieut. I. T. Lloyd, S. Wales Bord.; Lieut. M. S. Stewart, A.S.C.; Temporary Lieut. J. C. Russell, R.E.; Lieut. E. N. Clifton, C. Gds., Special Reserve; Lieut. O. Greig, Special Reserve; Temporary Lieut. the Hon. E. F. P. Lubbock, A.S.C.; Lieut. A. Lees, R. W. Kent R.; Temporary Second Lieut. J. Sowrey, General List; Second Lieut. R. C. L. Holme, Som. L.I.; Second Lieut. I. H. D. Henderson, Arg. and Suth'd. Highrs.; Second Lieut. C. T. Black, R. War. R.; Second Lieut. A. L. Neale, Linc. R.; Second Lieut. J. W. Gordon, Special Reserve. Temporary Lieut. A. M. Miller, General List; July 12th, 1916. Temporary Lieut. C. Danby, General List; July 13th, 1916. July 16th, 1916: Capt. C. MacKay, 5th Leins. R., Special Reserve, from a Flying Officer. *From Flying Officers, and to be Temporary Captains whilst so employed:* Second Lieut. A. H. O'H. Wood, Special Reserve; Second Lieut. A. T. Watson, Special Reserve.

Flying Officers (Observers).—July 13th, 1916: Temporary Capt. A. A. Nathan, Herts Yeo. (T.F.); Lieut. G. E. F. Sutton, 28th Canadian Inf. Bn.; Temporary Second Lieut. F. de B. Collenette, W. York. R., and to be transferred to the General List.

Assistant Equipment Officers.—July 12th, 1916; Second Lieutenants, Special Reserve: J. Y. de la C. Elliott, M. Myers, A. C. Blackmore, J. A. Chown, E. Rivers-Smith, and H. Straker.

Memoranda.—The under-mentioned to be Temporary Second Lieutenants for duty with Royal Flying Corps. July 22nd, 1916: Cadet A. Morgan, from No. 3 O.C.B.; Cadet W. E. V. Richards, from Bristol Univ. O.T.C. July 29th, 1916: Sergt. F. J. Chown, from St. Paul's School, O.T.C.; Corpl. C. M. White, from St. Paul's School O.T.C.

Supplementary to Regular Corps.—G. Barrett, to be Second Lieutenant (on probation); June 17th, 1916, but with seniority as from 20th Nov., 1914. (Substituted for the notification in the *Gazette* of June 27th, 1916.) The under-mentioned to be Second Lieutenants (on probation). July 12th, 1916: E. E. Robb, A. Clark, C. W. Elliott; July 17th, 1916. July 22nd, 1916: F. W. Keddie, W. Fowler, P. H. R. Whittet, S. S. Jefferies, A. B. Raper, S. J. Young, M. Johnstone, E. D. Doring, W. M. Smith, W. F. Dobson, A. L. Macfarlane, R. C. Orlebar, F. P. Williams, J. E. Histed, A. L. Pattinson, H. D. F. Fraser, R. B. Bourne, E. Armitage, C. Crawford, T. W. L. Dickson, R. W. Farquhar, S. H. Bell, T. M. Finnie, A. L. C. Hartland-Rowe, J. J. Scaramanga. The date of appointment of Second Lieut. (on probation) F. C. Young is July 22nd, 1916, and not as in the *Gazette* of July 11th, 1916.

Aeronautical Inspection Department.

THE following appeared in a supplement to the *London Gazette* issued on July 27th:—

Temporary appointment made:—

Inspector of Engines.—Qr.-Mr. and Hon. Lieut. (Temporary Capt.) J. Starling, R.F.C., from an Equipment Officer, and to retain his temporary rank whilst so employed; July 1st, 1916.

Royal Flying Corps (Territorial Force).

THE following appeared in the *London Gazette* of July 28th:—

Hampshire Aircraft Parks.—Lieut. W. J. Stutt relinquishes his commission on appointment to the Aeronautical Department, Australian Commonwealth Government; May 30th, 1916, instead of as previously notified.

AWARDS TO THE R.F.C.

IN a supplement to the *London Gazette* issued on July 27th it was announced:—

His Majesty the King has been graciously pleased to approve of the appointment of the under-mentioned officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the field:—

CAPTAIN S. GRANT-DALTON, York. R., and R.F.C.

For conspicuous gallantry and resource. When on return from escort duty his observer, Second Lieutenant Paris, discovered one of our machines which had been forced to land in enemy country owing to damage by hostile fire. Captain Grant-Dalton with great gallantry landed, destroyed the machine, which was past repair, and returned ninety miles to his aerodrome with his observer and the pilot of the other machine.

SECOND LIEUTENANT G. R. McCUBBIN, Royal Flying Corps., Special Reserve.

For conspicuous gallantry and skill. Seeing one of our machines about to engage two Fokkers he at once entered the fight, and his observer shot down one Fokker, which crashed to the ground. On another occasion, when returning from a bombing raid, he saw one of our machines being followed by a Fokker. He recrossed the lines to the attack, and his observer shot down the Fokker. Although very badly wounded in the arm, he successfully landed his machine well behind our lines.

His Majesty the King has been graciously pleased to confer the Military Cross on the under-mentioned officers and warrant officers, in recognition of their gallantry and devotion to duty in the field:—

CAPTAIN R. N. ADAMS, R. Fus., Special Reserve, and R.F.C.

For conspicuous gallantry and skill. With Second Lieutenant Vernon as observer, he attacked a flight of six enemy machines within the enemy's lines, and caused one to fall in flames. He was then joined by another of our machines, and together they drove off the remainder, one falling out of control. Previously with Second Lieutenant Cloete as observer he brought down an enemy machine, which turned upside down.

CAPTAIN M. McB. BELL-IRVING, D.S.O., Royal Flying Corps, Special Reserve.

For conspicuous gallantry when on a photographic reconnaissance. When very severely wounded in the head by fire from an anti-aircraft gun, and half-blinded by blood, he steered for the nearest aerodrome, and, feeling that he could not last out, landed safely in a small field well within our lines. After giving orders for the safe delivery of his photos. he collapsed. His pluck and skill saved his observer.

LIEUTENANT (TEMPORARY CAPTAIN) R. BALCOMBE-BROWNE, R.F.A., Special Reserve, and R.F.C.

For conspicuous gallantry and skill. He attacked an enemy kite balloon and brought it down in flames. He was flying in a type of machine unfamiliar to him owing to the absence through wounds of the regular pilot. At dawn he commenced to learn the machine, and the same evening brought down the kite.

LIEUTENANT J. S. SCOTT, Can. Local Forces and R.F.C.

For conspicuous gallantry and skill. He descended to 1,000 ft. to attack a train well behind the enemy's line, and though his engine was much damaged, his tank pierced, and his flying wires carried away by hostile fire, he succeeded in landing his machine safely within our lines.

Lieutenant (Temporary Captain) W. A. Summers, 18th Hrs. and R.F.C.

Temporary Lieutenant W. O. T. Tudor-Hart, North'd. Fus. and R.F.C.

For conspicuous gallantry and skill. Capt. Summers, as pilot, and Lieut. Tudor-Hart, as observer, attacked a flight of 10 enemy aeroplanes, completely breaking up their formation. They were quite unsupported, but only broke off the engagement when all their ammunition was expended many miles over the enemy's lines. Their machine was under constant heavy fire from as many as four hostile machines at once, and was badly damaged.

Second Lieutenant A. Ball, 7th Bn., Notts and Derby R. (T.F.), and R.F.C.

For conspicuous skill and gallantry on many occasions, notably when, after failing to destroy an enemy kite balloon with bombs, he returned for a fresh supply, went back, and brought it down in flames. He has done great execution among enemy aeroplanes. On one occasion he attacked six in one flight, forced down two and drove the others off. This occurred several miles over the enemy's lines.

Second Lieutenant D. Cloete, Royal Flying Corps, Special Reserve.

For conspicuous gallantry and skill. When one of our machines, piloted by Capt. Adams, was engaged with six enemy machines, he dived on to one of the enemy, drove it down out of control, and then assisted in driving away the remainder. Previously, when acting as observer to Capt. Adams, he brought down an enemy machine, which turned upside down.

Second Lieutenant (Temporary Captain) J. A. Crook, Royal Flying Corps, Special Reserve.

For conspicuous gallantry. He attacked and drove down to 6,000 ft. a hostile machine, and finally, assisted by another aeroplane, brought it to the ground. He has previously done excellent work, often under heavy anti-aircraft fire.

Second Lieutenant D. A. L. Davidson, Royal Flying Corps, Special Reserve.

For conspicuous gallantry and determination. When attacked by an enemy fighting scout, his machine was heavily damaged, the control being shot away, and he himself being wounded in three places. He succeeded, however, with great skill in reaching his aerodrome and landing safely, after which he had to be lifted out and carried to hospital.

Second Lieutenant A. G. D. Gavin, R. Highrs., Special Reserve and R.F.C.

For conspicuous presence of mind and unselfish courage. When his balloon broke loose and drifted fast towards the enemy's lines, he instructed his passenger in the use of the parachute and helped him out of the basket. He then destroyed all his papers, and descended by his own parachute, landing under machine-gun fire close to the trenches. His passenger also landed safely.

Second Lieutenant (Temporary Captain) W. A. G. Bellew, Conn. Rang. and R.F.C.

For conspicuous gallantry and skill on several occasions, notably the following :—

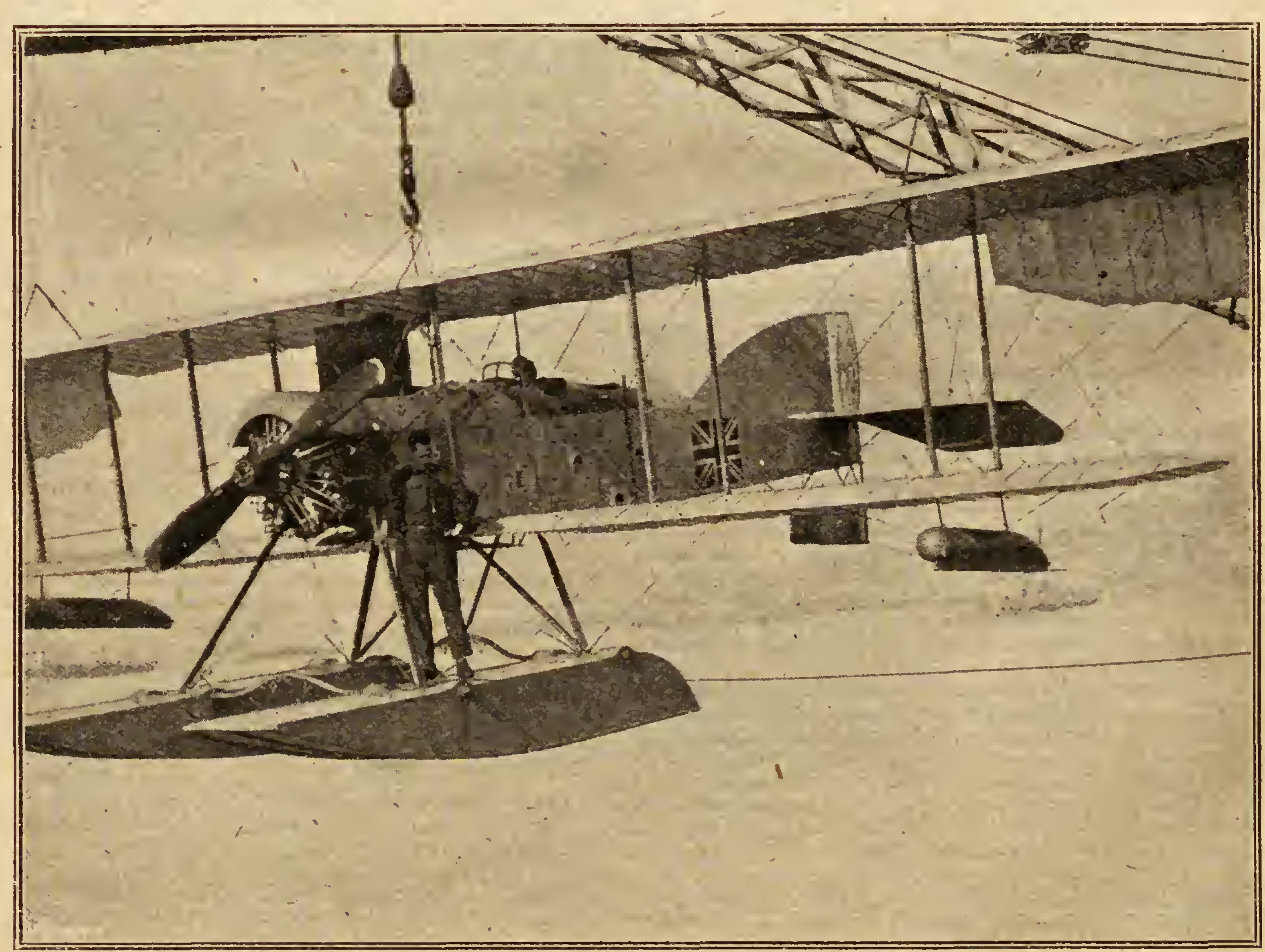
With three other machines he attacked and drove off eight enemy machines, forcing one to the ground.

He attacked four Fokkers, forcing one down to 2,500 ft. Another was seen to crash to the ground during the fight.

When on a bombing raid two of the machines got behind owing to clouds, and were attacked by Fokkers. Capt. Grattan Bellew returned and attacked three Fokkers, one of which his observer shot down, and the others made off.

Second Lieutenant P. Huskinson, Notts. and Derby Regt. and R.F.C.

For conspicuous gallantry and skill. When attacking the enemy's communications, alone and without an observer, he



WITH THE BRITISH FORCES IN SALONICA.—A British seaplane being lowered to the water from the parent ship in Salonica Bay. (*Official photograph issued by the Press Bureau.*)

descended to 800 ft. in order to release his bombs on a train and station. He was under continuous fire, and his engine and machine were seriously damaged, but he succeeded in flying back at a low altitude and safely landing within our lines. He was again heavily fired at as he crossed the lines.

Second Lieutenant A. S. C. MacLaren, K.O. Scot. Bord., Special Reserve, and R.F.C.

For conspicuous gallantry. On approaching an enemy aerodrome he observed a hostile aeroplane on the ground preparing to start, with pilot and observer in their seats and mechanics holding on to the wings. He descended to 100 ft., dropped a bomb squarely into the machine and blew it up, together with pilot, observer and mechanics. He then attacked and set fire to a Fokker, which was in a hangar.

Second Lieutenant H. M. T. Lehmann, Essex Regt. and R.F.C.

For conspicuous gallantry and skill. When attacking the enemy's communications, alone and without an observer, he dived down to 1,000 ft., under heavy fire, released his bombs on a railway station with great effect, and successfully brought his machine back to his aerodrome.

Second Lieutenant C. W. P. May, R. Ir. Rif., Special Reserve, and R.F.C.

For conspicuous gallantry and skill. He dived low over the enemy lines under heavy fire to attack a kite balloon. He succeeded in hitting it and in bringing it to the ground in flames.

Second Lieutenant W. A. C. Morgan, 2nd Bn., Welsh Regt., and R.F.C.

For conspicuous gallantry and skill. With other pilots he attacked an enemy reconnaissance of nine machines. Under heavy machine-gun fire he got within 20 yards of one of them, shot the observer, and brought the machine down in our lines.

Temporary Second Lieutenant D. K. Paris, R.A. attached R.F.C.

For conspicuous gallantry and resource. When observer, with Capt. Grant-Dalton as pilot, he observed far within the enemy's country one of our machines on the ground damaged by hostile fire. They landed, destroyed the machine, which was past repair, and brought back the pilot 90 miles in their own aeroplane. It was due to Second Lieut Paris's keen observation and Capt. Grant-Dalton's skill that the pilot was rescued.

Second Lieutenant (Temporary Captain) H. Tomlinson, R.F.C., Special Reserve.

For gallantry and devotion to duty. Capt. Tomlinson has taken part in several raids. On two occasions he has had serious accidents at night flying, but he has not been in the least discouraged, and has continued to do most valuable work.

Second Lieutenant L. G. H. Vernon, R. W. Fus., attached R.F.C.

For conspicuous gallantry and skill. With Capt. Adams as pilot he attacked a flight of six enemy machines within their lines. They brought down one in flames, and, after being joined by a second British machine, drove off the remainder, one falling out of control. He has previously done fine work.

His Majesty the King has been graciously pleased to approve of the award of the Distinguished Conduct Medal to the under-mentioned warrant officers, non-commissioned officers and men for acts of gallantry and devotion to duty in the field :—

605 Sergeant-Major G. Felstead, No. 14 Sqdn., R.F.C.

For consistent good work. His devotion to duty has been invaluable in promoting the efficiency of the squadrons.

136 Flight-Sergeant H. Green, No. 21 Reserve Sqdn., R.F.C.

For consistent good work. By his perseverance and application he has, though very shorthanded, never failed to have aeroplanes ready for reinforcement.

718 Flight-Sergeant F. J. Hellyer, No. 17 Sqdn., R.F.C.

For conspicuous good work. He worked night and day to keep the aeroplanes in working order. The skill he displayed and the example he set enabled this detachment to carry out its duties with success.

2988 Flight-Sergeant E. Meynell, Hdqrs., 5th Wing, R.F.C.

For consistent good work as Orderly Room Sergeant. The work has been exceptionally heavy, and he has invariably shown great capability in dealing with it.

2707 Corporal L. Van Schaick, Recruits' Depôt, R.F.C.

For conspicuous gallantry and skill. As Observer to one of our machines on escort duty, he attacked an enemy machine and brought it down out of control in some small gardens. He has frequently brought in valuable reports when on reconnaissance.

5800 Corporal J. H. Waller, No. 25 Sqdn., R.F.C.

For conspicuous gallantry and skill. On one occasion, as passenger on an aeroplane, he dived on to an enemy biplane and shot it down. It was seen to crash to the ground. On another occasion, as passenger, he shot down a Fokker, which was also seen to crash to the ground.

198 Sergeant-Major F. Whilton, No. 17 Sqdn., R.F.C.

For consistent good work. His devotion to duty has been invaluable in promoting the efficiency of the squadrons.

BRITISH AIR WORK.

The Work of the Dover Patrol.

In the despatch, dated May 29th, from Vice-Admiral Sir Reginald Bacon, describing the work of the Dover Patrol, there is the following reference to the R.N.A.S. :—

"In addition to the daily reconnaissance and protective work performed by the Royal Naval Air Service on the coast, 11 organised attacks against the enemy's aerodromes and 13 attacks on enemy vessels have been carried out. Nine enemy machines and one submarine have been destroyed by air attack, and appreciable damage has been inflicted on military adjuncts.

"The services rendered by the naval airmen in Flanders, under Acting Captain Lambe, have been most valuable.

"It is equally advantageous to maintain the offensive in the air, as it is to do so on land or at sea. It is with considerable satisfaction, therefore, that I am able to report that, with only one exception, all the aeroplanes destroyed were fought over the enemy's territory, and that all the seaplanes were brought down into waters off the enemy's coast.

"The advent of spring weather has lately enabled me to take measures to limit the extent to which the submarine and other vessels of the enemy had free access to the waters off the Belgian coast.

"The success achieved has, so far, been considerable, and the activities of submarine operations from the Belgian coast have been much reduced."

Looping to Attack.

The following extract from a recent report of the R.N.A.S. was issued by the Air Board on July 28th :—

"Dunkirk.—On July 15th one of our aeroplanes, a Nieuport, patrolled 10 miles out to sea, and when approaching Ostend, at about 12,000 ft., encountered a German seaplane—a single-engine tractor type—500 ft. below him.

"The enemy manœuvred for a position behind and below the Nieuport, both machines meanwhile executing a steep glide. The British pilot thereupon looped over the enemy, who passed underneath him. He thus gained the desired position behind and opened fire into the seaplane at a range of 100 yards. The German pilot, who was evidently hit, made a vertical nose-dive. The machine was last seen in flames falling headlong downwards."

British Pilot Fights Zepp.

The Secretary of the Admiralty on Monday made the following announcement :—

"At 5.15 this morning one of our aeroplanes pursued and attacked a Zeppelin 30 miles off the East Coast.

"The pilot had fired over two trays of ammunition into the Zeppelin, when he was temporarily incapacitated by a portion of his machine-gun flying off and stunning him.

"The Zeppelin was nowhere to be seen when the pilot regained consciousness, and he was therefore forced to return to his station."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A Special Meeting of The Committee was held on Thursday, July 27th, 1916, when there were present: Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight-Commander C. F. Pollock, R.N., and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Neville John Campkin.

Second Lieutenant John Wallace Gellatly Mackinlay, R.F.C.

Flight-Commander Redford Henry Mulock, R.N.

Second Lieutenant William Alan Jeune Willans (60th Rifles).

SPECIAL GENERAL MEETING.

A Special General Meeting of the Members of the Royal Aero Club was held on Thursday last, July 27th, 1916, at 166, Piccadilly, London, W. Prof. A. K. Huntington, Vice-Chairman, presided, and there were about 40 Members present.

New Club Premises.—The following summary of the replies received with reference to acquiring a Club House and raising the Annual Subscription to £5 5*s.* was submitted to the Meeting:—

Summary of Replies Received up to July 26th, 1916 from (1) Members Elected since the Original Inquiry was made in October, 1913; (2) Members who had Changed their Opinion since Replying before; and (3) Old Members who had not Replied before.

(a) *Members in favour of new premises and who would pay £5 5s. Subscription.*

New members	78
Members not in favour before	19
Members who had not replied before	16
	113

(b) *Members in favour of new premises but who were unwilling to pay £5 5s. Subscription.*

New Members	3
Members willing to pay increased Subscription before	2
Members who had not replied before	3
	8

(c) *Members not in favour of new premises and who would not pay £5 5s. Subscription.*

New Members	2
Members in favour before	3
Members who had not replied before	2
	7

(d) *Members not in favour during the War.*

New Members	1
Members in favour before	1
Members who had not replied before	4
	6

136 other replies had been received from Members who expressed the same opinion before, as under:—

Members willing to pay the increased Subscription	102
Members unwilling to pay the increased Subscription	34

(14 of these were not in favour of the Club acquiring new premises during the war.)

25 suggestions had been made that there should be a distinction in the Subscription for the following:—

(1) Founder and Old Members.

(2) Country Members.

(3) Members who paid the Subscription merely to support the Club.

Professor Huntington said that he thought the replies received were exceedingly satisfactory. The present premises were unworthy of the Club, and the majority of the Members, especially Service Members, required a Club House. Many Members had no other Club, and as far as one could gather new Flying Officers wished to join the Club, but were not inclined to do so on account of the usual facilities not being offered in the present premises. He thought that it was important (not only from a social point of view) that the Club should be brought into touch with these Officers. Some people pointed out that many Clubs were doing very badly now, but he thought the Royal Aero Club was differently situated in this respect on account of the rapid development of aeronautics. With regard to raising the Subscription, people connected with aeronautics were better off now than they had been, and he thought, therefore, that they would be willing to pay a Subscription of £5 5s.

The Committee had one or two suitable premises in view, but he thought it would be unwise to give particulars of these before negotiations had actually been completed.

A discussion followed on the question of acquiring a Club House in which the following took part: Mr. E. R. Adams, Mr. Charles Bright, The Earl of Carnwath, Mr. R. O. Cary, Mr. Henry Knox, Mr. W. M. Morrison, Lieut.-Com. H. E. Perrin, R.N.V.R., Mr. E. O. Sachs, Mr. F. Harold Sully, Lieut. G. T. Temple and Mr. G. Holt Thomas.

On the motion of Mr. Henry Knox, seconded by Mr. Charles Bright, it was unanimously resolved that Rule 50 be altered as follows:—

> Rule 50.—For the year 1917 and thereafter the subscription for Members shall be £5 5*s.* per annum and for Lady Members £2 2*s.* per annum or such other sum as may be decided upon in General Meeting, and the entrance fee £2 2*s.*, or such other sum as the Committee may from time to time determine.

The Meeting concluded with a vote of thanks to the Chairman.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to July 25th, 1916	10,797	5	11
Staff and Workers of Gwynnes, Ltd. (Twentieth Contribution)	7	14	3
Collected at the Westland Aircraft Works, Yeovil (Forty-second contribution)	0	18	0
R. H. Dewes	0	3	6
Total, August 1st, 1916	10,806	1	8

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

Straights with Instructor last week: Messrs. Alty, Duncan, Edwards, Fisher, Lyles, Ormerod, Saunders, Soden and Styles. Circuits with Instructor: Messrs. Ballard, Drew, Jamie and Stevens. Eights with Instructor: Messrs. Cooper, Donald, Goodhart, Kay, Keymer, and Phillips. Instructors during week: Messrs. Manton, Winter, Pashley, Hale and Biard.

Beatty School, Hendon.

The following pupils were out during last week: Messrs. Cuthbert, Gliksten, Garlick, Hathaway, Earl, Skeet, Mitchell, Rudd, Gadsden, McPherson, Towson, Elliott, Austen, White, Curry, Wood, de Wilde, Sach, Owen, J. Squires, and Wilkinson.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes. Certificates were taken during the week by Mr. R. H. New, on a Beatty-Wright machine, and Mr. W. G. Edwards, on a Caudron.

Hall School, Hendon.

Pupils at work last week: With Cecil M. Hill: Mr. Duncan. With P. G. Allen: Messrs. Russell, Henley, Illingworth, Cownie, Course and Cordner. With F. G. Glegg: Mr. Stampes, Lieut. Raymond Malden, Messrs. Course, Smith and Mayer, and Lieut. Packman. Hall (Government type) tractor machines in use.

Certificate taken by Mr. Duncan in good style.

London and Provincial School, Hendon.

Pupils doing rolling last week: Messrs. Quayle, Mander, Lewis, Randell, Birkins and Fox. Pupils doing straights: Messrs. Sivewright, Quayle, Egerton, Leman, Bush and Vickers. Pupils doing circuits and eights: Messrs. Bush, Vickers, and Sivewright.

Bournemouth School.

Pupils rolling alone last week: Messrs. Kennedy, Ross, Montgomery, Holland, Owen and Davies. Pupils doing straights: Messrs. O. Wilson, Smith, Adamson, Daniel, Hammersley, Little, Pritt, J. B. Smith and Fenn. Half circuits alone: Messrs. J. Wilson and J. L. Barlow.

Instructors: Messrs. S. Summerfield and E. Brynildsen. Two 35, one 45 and one 60 h.p. Caudron biplanes in use.

FLYING AT HENDON.

ALTHOUGH the weather was exceptionally fine last Saturday and Sunday, Hendon Aerodrome was by no means overcrowded. Possibly for the time being under-sea craft are a greater attraction than aircraft, and the exhibition of the U-boat in Father Thames may have appropriated many would-be visitors to Hendon. Early in the afternoon the intense heat rendered flying a trifle trying, it being a little bumpy, and there was a marked absence of lift in the air. Nevertheless, plenty of flying was put up by the few pilots that had the energy to leave the shade of the hangars. Apparently, W. Birchenough was doing his utmost to keep cool by following in the slip-stream of his own de Havilland scout. Any way, if he did not succeed in this he certainly thoroughly churned up the air and made matters cooler that way. H. Sykes and A. A. Fletcher (still smiling) tried looping the loop on the 100 h.p. Anzani-Martinsyde tractor biplane as a cooler, and then, as friend Fletcher, who occupied the front seat, found the atmosphere coming from the engine just a *trifle* warm, he induced the pilot to try and fly the machine tail first, but, it must be admitted, without success. The machine absolutely refused to, and each time they pointed the nose Heavenwards, down flopped the nose the other way. Shortly after, slight trouble with the magneto put the Martinsyde out of action for the time being. H. C. Biard, B. F. Hale, Marcus D. Manton, and C. Pashley made many flights with passengers on the 80 h.p. G.-W. three-seater biplane. L. L. King, of the Beatty School, now quite recovered from his accident, was out on one of the Beatty-Wright biplanes fitted with a 50-and-a-little-bit-more h.p. Beatty engine. In addition to this several Service machines took the air, including some Renault-engined Caudrons piloted by René Desoutter.

Sunday's flying consisted of passenger flights galore on the G.-W. three-seater, a further demonstration of the new cooling process by W. Birchenough on a de Havilland scout, a rival demonstration (in the Welsh Harp) by a Service pilot and his passenger, described elsewhere in this issue, and a cross-country flight by René Desoutter on a Renault-Caudron.

Flying at Bournemouth and Poole.

MR. S. SUMMERFIELD was in his best form at the Bournemouth Aerodrome on Wednesday of last week, and his exhibition of trick flying was greatly appreciated by the large crowd, who, taking advantage of the fine weather, visited the aerodrome. On Saturday the Bournemouth Aviation Co., accepting the invitation of the Committee of the Soldiers' Home and Hospital at Poole, arranged for their pilot, Mr. Summerfield, to pay a visit and give a free "show." He was accompanied on the 14 min. trip by Mr. F. E. Etches, and the landing, by a spiral *vol plané* from a height of 3,000 ft., in Poole Park was a piece of skilful piloting which was audibly appreciated by the wounded soldiers. The flags which had decorated the 60 h.p. Caudron during its trip, together with a postcard autographed by pilot and passenger, were sold at Poole, and realised quite a goodly sum to enhance the Committee's funds. As the ground at Poole was very small and uneven, Mr. Summerfield had to return *solo*, but after getting up he executed several stunts before making off for Bournemouth.

Hints for Flight Subs.

THERE are many who are joining the Royal Naval Air Service at the present time who know practically nothing of the way they have in the Navy, and they will be duly grateful to "Fight-Lieutenant" for his little book of hints. It has been closely modelled on Capt. A. H. Trapmann's "Straight Tips for Subs.," and although it is only waistcoat pocket size, it should be worth its weight in gold to many a young officer, saving him much worry on many minor matters. It treats succinctly and simply of how to obtain a commission, pay and allowances, hints on kit, &c., Standing Orders at one of the principal air stations, &c. There are a number of coloured plates illustrating the uniforms of the various ranks and showing the meaning of the different badges, &c.

It is bound in blue cloth and published by Messrs. Forster, Groom and Co. at 1s. Copies can be obtained at "FLIGHT" Office, price 1s. 1d. post free.

Aerial Fight in the North Sea.

FISHERMEN arriving at Flushing on Saturday, according to the *Telegraaf*, reported having seen on the previous day at noon a fight between a large number of aeroplanes. The fishermen did not wait for definite results, but they did not see any machines brought down. There appears to be something mythical about this aerial battle.

Dutch Arrive Too Late.

A REPORT to the *Telegraaf* from Flushing says that a Dutch warship left the harbour there on July 24th to assist French aviators who had descended in a seaplane near the coast, but outside territorial waters. Meanwhile, however, a German destroyer had already captured the French aviators and towed the seaplane away in the direction of the Belgian coast.

Armchair Reflections

by the "Dreamer"

Up at sunrise on this bright Sunday summer morning, I sit in my little writing room and look out over the garden and the distant country, and I feel how gladsome a thing it is to rise early and watch the birth of another day.

Green in a hundred shades is Nature's carpet, stretched out before me as far as eye can see, blending in the southern distance with the purple of the night sky. A fleeting purple, becoming every moment lighter and changing to blue-gold before the molten glory riding higher and yet higher in the eastern sky.

In the near distance I have pictured for me sunrise on the Matterhorn, lower green slopes merging higher to purple, crowned at the summit with red-gold.

As my eye travels along from the meadowland mounting the slope, to the crown, it is as the crescendo of a great orchestra, the rumbling from the muffled side-drum gathering all other instruments in on its way, to form a mighty torrent of sound which explodes itself in cymballic crash midst the higher peaks.

For to me this silence, which can be seen, is seeing that can be heard. Yet I know full well that the Matterhorn is there beyond my garden only in my imagination, and that it is nothing but an Elizabethan mansion standing on high ground, its twisted red-brick chimneys rising high above the surrounding belt of trees to catch the first glow of the morning sunrise.

What wonderful material is this with which my window is glazed? that I should see in the far distance little groups of Alpine climbers wending their way by the cornfield-path. Alas for the tricks that vision and imagination play with the early riser, for as a fact those figures knee-deep in the waving corn are but men of the air, making their way to the aerodrome.

Soon from behind the little coppice on the right I shall see the great white wings soaring upward to greet the morning sun, its first kiss rose-blushing the underplanes.

Ah! it is much that is missed by the sluggard, who, rising, finds the day as he left it yesterday, ignorant of the wonderful promise of the golden sunrise, deaf to the glorious crash of mighty silence. For this is the time when man is nearer to Nature, the time when thoughts are born.

And so, as I write, the light is gathering in strength, the myriad tinting is changing to the commonplace, fancy's fiction fades before advancing day.

All too short is this period when imagination takes control and holds complete sway. For as the colours fade and the world takes on its everyday appearance, I know it for our everyday world—a world that is being torn and rent almost asunder by the vileness of man, where legalised murder is robbing millions of eyes of the power to see that which I have seen this morning.

And now the sun is topping the tall poplars, that long, straight line of waving green which appears to me as a curtain beyond which it is not good to look, for I am looking eastward. Perhaps it were well did I not try to see beyond those poplar trees.

The great presses of Fleet Street are in this early morning humming, and a little later shall be brought to my door the sheet in which I shall search eagerly for that which I most dread to find. It might be that to me that sheet shall be plain, blank white, with the exception of one single line of letters announcing receipt of the joint contribution of Mother and myself to our nation's need.

Yet, as with every single one of the fathers and mothers in this Empire, I am not afraid to look beyond that row of friendly poplar trees. For they are to the eastward, where the sun rises. And to the eastward is rising that sun which shall for ever dam the torrent of military infamy, to gild the whole world with its golden promise of everlasting peace; revealing by its strengthening light the vileness of man's greediness, the futility of his grasping. I think the men formulating that insulting poster, the one that places a money value on a man's arm, were not early risers. One such purifying sight as that which I witnessed this morning, pregnant with all whisperings of love for humanity, and that hideous poster with its degrading words would never have been. I can imagine its designers persuaded for once to witness, on midsummer day, the sunrise over Stonehenge. Seated in the vehicle that has conveyed them, they shall watch the glorious spectacle, purblind to its magnificence, deaf to its wondrous teachings. Men and women of Great Britain do not, thank God, think of their kith and kin engaged in this great struggle for Christianity, in terms of money value, and to suggest it is indiscretion carried to the extreme.

As I sit here, now bathed in the warmth of the early sun, the suggested value of my boy reposes in the top, left-hand pocket of my waistcoat, it is but a single penny piece. His real value to me lies hidden from the world on the same side of my body, but a little deeper.

There is but one of two things that can happen to that penny. Either, some day, I shall return it to him with thanks, or, stamped with R.F.C. and his name and a date, unadorned with golden setting or embellishment of any kind, it shall, just a simple bronze coin hanging round my neck, pass with me to the Evermore.

Bless my soul! How these early morning watches do affect a man's brain, and into what curious channels do his thoughts run of their own accord. It is just possible that, "somewhere out there," these words will be read by one who, knowing the writer, will think what a queer old dad it has become, and smile at home misgivings for his safety, when he is having such a perfectly lovely time.

Well, perhaps all dads are queer old dads when it comes all-to, and this one stands by no means alone. But we allow ourselves to think these thoughts only in the early mornings, when alone.

About that penny? Oh, he gave it to me on the platform at Waterloo. I having no change, the ticket-clipper passed me on to pay on return. But I changed a ten-shilling note instead. Queer chaps, "Dreamer Dads" and ticket-clippers get wroth at their queer ways.

REPORT ON THE ROYAL AIRCRAFT FACTORY.

We have the honour to submit our report on inquirie made by us into the affairs of the Royal Aircraft Factory, Farnborough, in compliance with the terms of reference conveyed in your letters of March 30th and extended in that of April 18th, which are as follows :—

"To inquire and report whether, within the resources placed by the War Office at the disposal of the Royal Aircraft Factory and the limits imposed by War Office orders, the organisation and management of the Factory are efficient, and to give the Army Council the benefit of their suggestions on any points of the interior administration of the factory which seem to them capable of improvement."

We have received all assistance desired by us from Lieut.-General Sir David Henderson and the Staff of the Military Aeronautics Directorate ; Lieut.-Col. M. O'Gorman, Superintendent, Major Heckstall Smith, Assistant Superintendent, and the staff of the Royal Aircraft Factory also afforded us every facility for the fulfilment of the duties imposed upon us in our terms of reference. We desire to express our thanks to all these gentlemen.

We found the organisation and administration of the Royal Aircraft Factory to be as shown on the table attached, marked Appendix "A."

The functions of the Royal Aircraft Factory we understand to include original designs of aeroplanes and engines, improvement of existing designs, manufacture of experimental aeroplanes, engines and their parts, and aeronautical devices ; study of and experimental work in all material used in an aeroplane ; preparation of drawings and specifications for contractors, and, in certain cases, supervision of manufacture ; repair of aeroplanes and engines, and provision of aeroplane and engine spare parts for maintenance ; production of aeroplanes in limited quantity ; and emergency work of all kinds to assist contractors or to make good the failure of contractors.

From which it is apparent that the War Office has laid it down that the Royal Aircraft Factory should be devoted to experimental rather than manufacturing purposes.

The Royal Aircraft Factory cannot therefore be regarded as an establishment working on strictly commercial lines ; it is rather a very large experimental laboratory, probably the largest in the United Kingdom, where experiments are carried out to full scale, therefore expenses must necessarily be high. Experiments upon models to reduced scale are conducted by the National Physical Laboratory as and when required by the Aeronautical Committee or it may be by the Royal Aircraft Factory.

The only manufacturing work done since the war began seems to have been an output of about 50 non-experimental machines and the manufacture of spare parts to meet urgent demands. The orders for spare parts are very numerous, but mostly for small quantities ; they, however, aggregate a fair total and their production is an important function of the Royal Aircraft Factory. It is therefore essential that their manufacture and despatch should be economic and expeditious.

The Royal Aircraft Factory has produced * new machines in all since the commencement of the war, while the trade supplies have exceeded * machines.

The approximate value of orders placed by Military Aeronautics Directorate from August 1st, 1914, to March 31st, 1916, for aeroplanes, engines and spares of Royal Aircraft Factory design is *, and of private design about half this amount.

The strength of the Royal Aircraft Factory on March 26th, 1916, was stated by Capt. Douglas to be *. Wages for the week ended March 26th, 1916, amounted to *, excluding the salaries of eight chief officials totalling * per month, and together would, if maintained, show a total of * for a year.

We were informed that the total expenditure on the Royal Aircraft Factory account for the year ended March 31st, 1916, was :—

	£
For wages, salaries and expenses	*
For materials	*
	*

These figures include sums, not at present precisely known, for increases in capital account ; a rough estimate being mentioned as between £60,000 and £70,000.

We have been supplied with a copy of the balance-sheet for 1914–15, but the conditions of working during that period were so different to the present, that we have not been able to make any very pertinent use of the figures therein contained.

Major Heckstall Smith supplied us with diagrams from which we have endeavoured to work out the present percentages of the total absorbed by the various classes of work carried out in the Royal Aircraft Factory. Col. M. O'Gorman has checked these figures, which are as follows :—

	Per cent.
(*a*) For experimental work, including a sum of about £5,000 on indirect expenditure ..	22
(*b*) Construction of aeroplanes	35
(*c*) Repairs to aeroplanes and manufacture of spare parts	33
(*d*) Repairs to engines and manufactures of spare parts	10
	100

The second item, (*b*) construction of aeroplanes, will apparently include not only the manufacture of the new aeroplanes in supply already referred to, but the experimental aeroplanes made in proof of designs prepared on paper. As far as we are able to analyse these figures, it would appear that miscellaneous items amounting to about 17 per cent. are spread over (*b*), (*c*) and (*d*).

We were informed that the preparation of a complete design of a new aeroplane occupies from six to nine months before any practical building in quantities can commence. During this period it is understood that the full-size experimental machines are being produced in the shops concurrently with the preparation of the working drawings. We were further informed that it does not infrequently happen that the exigencies of war pressure have made it necessary to place orders with the trade for complete machines before the governing designs are completed in all particulars. It is almost inevitable that up to the time the design is actually finished and proved by the experimental machine, alterations in dimensions of parts will be liable to occur. When orders have been placed with the trade before such a condition of affairs has been arrived at, contractors must be called upon to alter, it may be even to scrap and reproduce parts affected. Payment is, we understand, made in compensation for such variations.

The whole administrative system appears to us to be extremely elaborate, both as regards the records of all particulars of material used in the manufacture of each part of an aeroplane, or engine, but also as regards the course through which the components pass in the various stages from the raw material to the finished article.

During the course of our inquiries, it was brought somewhat prominently to notice that a considerable amount of criticism adverse to the Royal Aircraft Factory administration has been voiced by the Press and apparently also by the aeronautical trade generally. It is possible that it may be due to the occurrence of very numerous alterations made after the issue of manufacturing drawings not the fault of the Royal Aircraft Factory and also to absolute errors in drawings the fault of which must wholly rest with the Royal Aircraft Factory.

Our attention has been drawn to several cases of errors in drawings issued to the trade, which with proper organisation ought not to have been passed.

Conclusions.

From the inquiries we have made and the data afforded to us we are led to the following conclusions :—

We are of the opinion that such an experimental establishment as the Royal Aircraft Factory should be in existence. That on its present wages cost the Factory efficiency could be enhanced as an experimental place and a substantially increased volume of finished work produced provided a sharp line of demarcation be drawn between experimentation and commercial productivity, and the factory be reorganised and managed as nearly as possible upon a commercial and engineering basis.

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* It is not considered desirable in the public interest to publish the exact figures.

From information afforded both at Farnborough and London we conclude that the standard of efficiency required by the War Office for Royal Aircraft Factory finished products is regarded as met, both as to construction and design.

The existing undesirable trade feeling referred to we consider should be met and, if possible, overcome, as its existence can hardly fail to have a detrimental effect on all concerned. We do not consider that the competition of the Royal Aircraft Factory with the Trade should, if reasonably administered, be the cause of any detrimental friction or trade feeling.

From articles and letters in the Press it seems to be considered that British aviators, as compared with enemy aviators, suffer from want of speed in aeroplanes. If this complaint is well founded, there would appear to have been some lack of foresight (whether on the part of the Royal Aircraft Factory or the War Office is not clear) as to the size of engines required to meet war conditions. We are informed that higher powered engines are now being bought from the trade, that some have already been delivered, and are being fitted into concurrently produced machines.

We consider that during the period of war activity the financial resources placed at the disposal of the Royal Aircraft Factory for experimental purposes have been ample to allow experimental work to be expeditiously performed in an efficient manner, and in a degree which should have placed useful and essential data at the disposal of the War Office, Admiralty and private trade. We have no information as to the extent which the Admiralty have availed themselves of the data put at their disposal.

It appears to us that the emoluments offered to heads of departments and others of high technical ability have been too low and are hardly likely to attract many highly qualified gentlemen, or, if attracted, to retain their services. We are of opinion that the work done by the Staff merits more consideration than has hitherto been accorded.

The weakness inherent to a system of under payment has been most materially counteracted since the outbreak of the war, because many gentlemen of the highest ability and standing whose emoluments in private work command salaries of possibly many hundreds or even thousands per annum, are working at salaries so small as to be negligible in their cases. This addition to the technical strength of the establishment has undoubtedly been of the utmost value to the country and the Royal Aircraft Factory.

It has appeared to us that the numbers now engaged in the Central Office, Stores, and other departments of a non-productive nature, reveal an organisation more liberal than is generally found in Government establishments, and on a scale unknown to us in private works. For instance, the Central Office and Stores are manned by* employees out of a total of *.

It has been brought to notice that experiments and other manufacture have not infrequently been delayed owing to lack of material. A carefully selected larger stock of those materials constantly used should more than earn the interest upon the capital involved.

An experimental establishment of this magnitude should be provided with a full equipment of labour-saving devices which are undoubtedly necessary for economic and most rapid production. From such resources, properly utilised, a reduction in number of employees now necessarily working round a particular operation could be effected.

We understood from General Sir David Henderson that he has contemplated strengthening the Department of Aircraft Equipment in London by transferring the designs portion of the Royal Aircraft Factory to London. We are strongly of opinion that any attempt to separate the designs branch from the shops would be disastrous.

From the foregoing it will be apparent that while fully alive to the ungrudging work done under the trying conditions of war pressure by the Superintendent and Staff of the Royal Aircraft Factory, we think there are parts of the organisation and management where improvements are possible.

Suggestions.

Arising out of the foregoing conclusions after full consideration, we beg to offer the following suggestions or recommendations in compliance with our revised terms of reference :—

We suggest that a Board of Management be formed consisting of a Chairman or Director of the Royal Aircraft Factory, a Superintendent of Designs and a Superintendent of Manufacture, all of whom should be preferably civilians and should give their whole time to the affairs of the Factory, and a Military Adviser without distinctive executive duties. The three last-named gentlemen should rank equally with one another on the Board.

The Director should be well equipped with previous commercial and scientific engineering qualifications and experience. It is not considered essential that he should possess any intimate or previous knowledge of aviation. He should be selected for his recognised ability in administration and management.

We believe the organisation we are suggesting would be much assisted by the appointment of a civilian of high standing and suitable qualifications as Controller of Aircraft Supplies, who would have his headquarters in London and have among his duties the direct communications with contractors and the Royal Aircraft Factory.

As we believe that the capacity of the Factory could be greatly augmented without increase to the present number of employees, we suggest that this should be arrived at in the shape of additional current manufacture of aeroplanes and engines, without impairment, and indeed with increased efficiency of the experimental functions of the Royal Aircraft Factory as now existing.

With regard to the shortage of higher-powered engines, of which the need appears to be great, we suggest that special and strenuous efforts should be made immediately both by the Royal Aircraft Factory and by means of financial assistance, if necessary, to the trade, so that the most rapid production of all the engines may be secured.

We think it would be better that direct contact with contractors, including the issue to them of drawings, should be made through a third party, *e.g.*, the Controller of Aircraft Supplies, and not by the Royal Aircraft Factory. It is, of course, undesirable to cut off all communication between the Royal Aircraft Factory and the trade, but we think it would be preferable that inquiries should first of all be made to the officer issuing drawings, presumably the Controller of Aircraft Supplies, and that he should put any particular contractor into touch with the Royal Aircraft Factory in order that any desired information, data, or explanations, may, when required, be afforded direct. This course would also keep track of alterations, if any, from the original approved designs. Of course, the Controller of Aircraft Supplies and the Director of the Factory would, in fact, be in reasonably close touch.

No useful purpose would be served at this juncture by the submission of recommendations as to the Central Office and Stores. If actually too elaborate, as they seem to us to be at present, the re-arrangement of duties suggested herein would naturally lead to some change in this direction, but it should preferably be left for the action of the new board of management.

We desire to express our thanks to Mr. R. H. Griffith, who has acted as our secretary throughout our investigations.

We have the honour to be,
Sir,
Your obedient Servants,
RICHARD BURBIDGE, Chairman.
CHARLES A. PARSONS.
H. F. DONALDSON.

R. H. GRIFFITH, Secretary.
May 12th, 1916.

II.

REPORT TO THE WAR COMMITTEE BY THE AIR BOARD ON THE SUBJECT OF THE ROYAL AIRCRAFT FACTORY.

Among the subjects to which the Air Board have turned their attention has been the administration and organisation of the Royal Aircraft Factory. They have taken evidence on the matter, and have further given careful consideration to the annexed Report of the Committee appointed by the Army Council of which Sir Richard Burbidge was Chairman.

The Air Board are of opinion that this Committee has rendered a valuable public service by its investigation of the management and organisation of the Factory. They think, however, that in certain respects the Report may give a not altogether correct impression, and with some of

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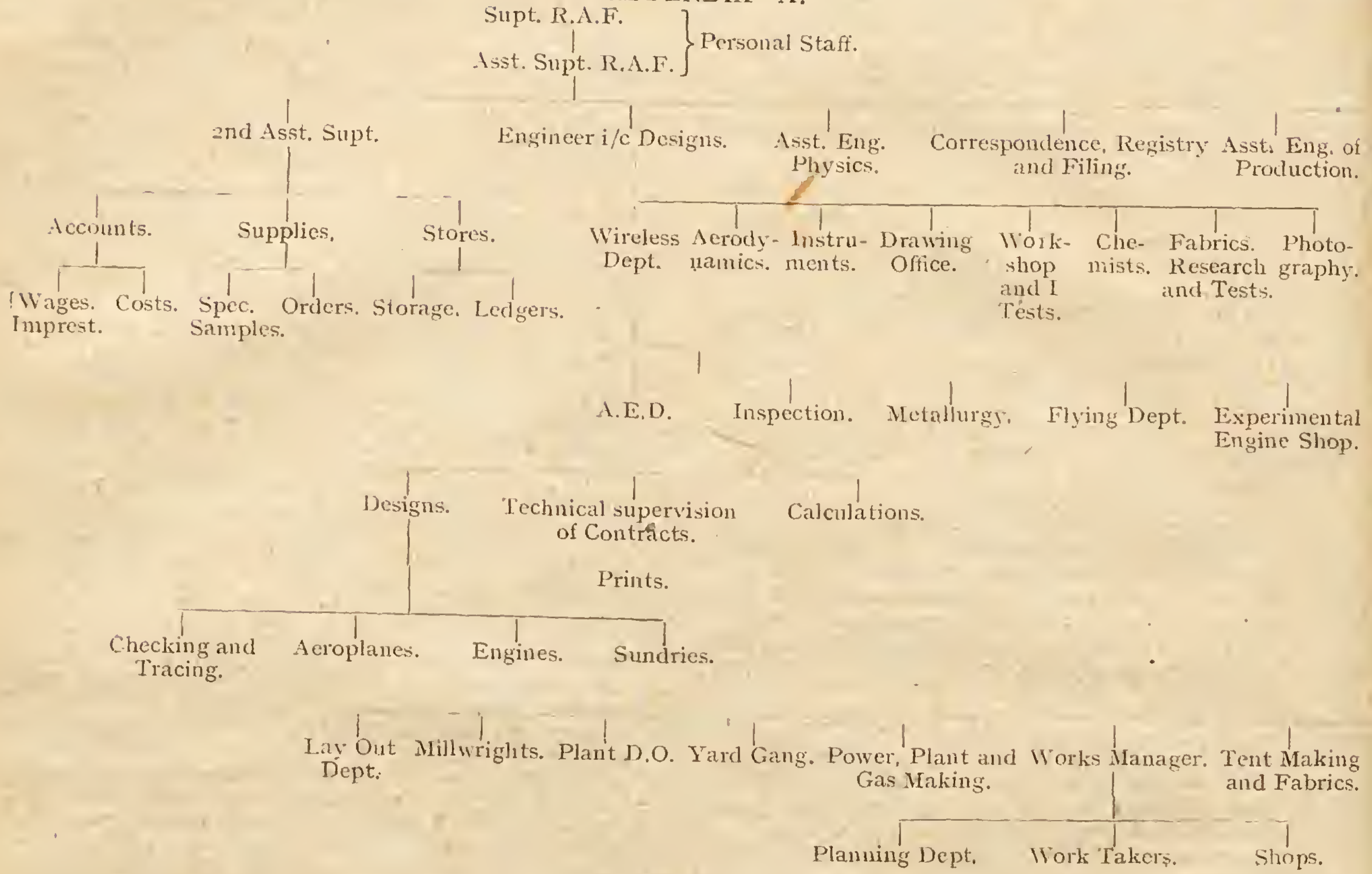
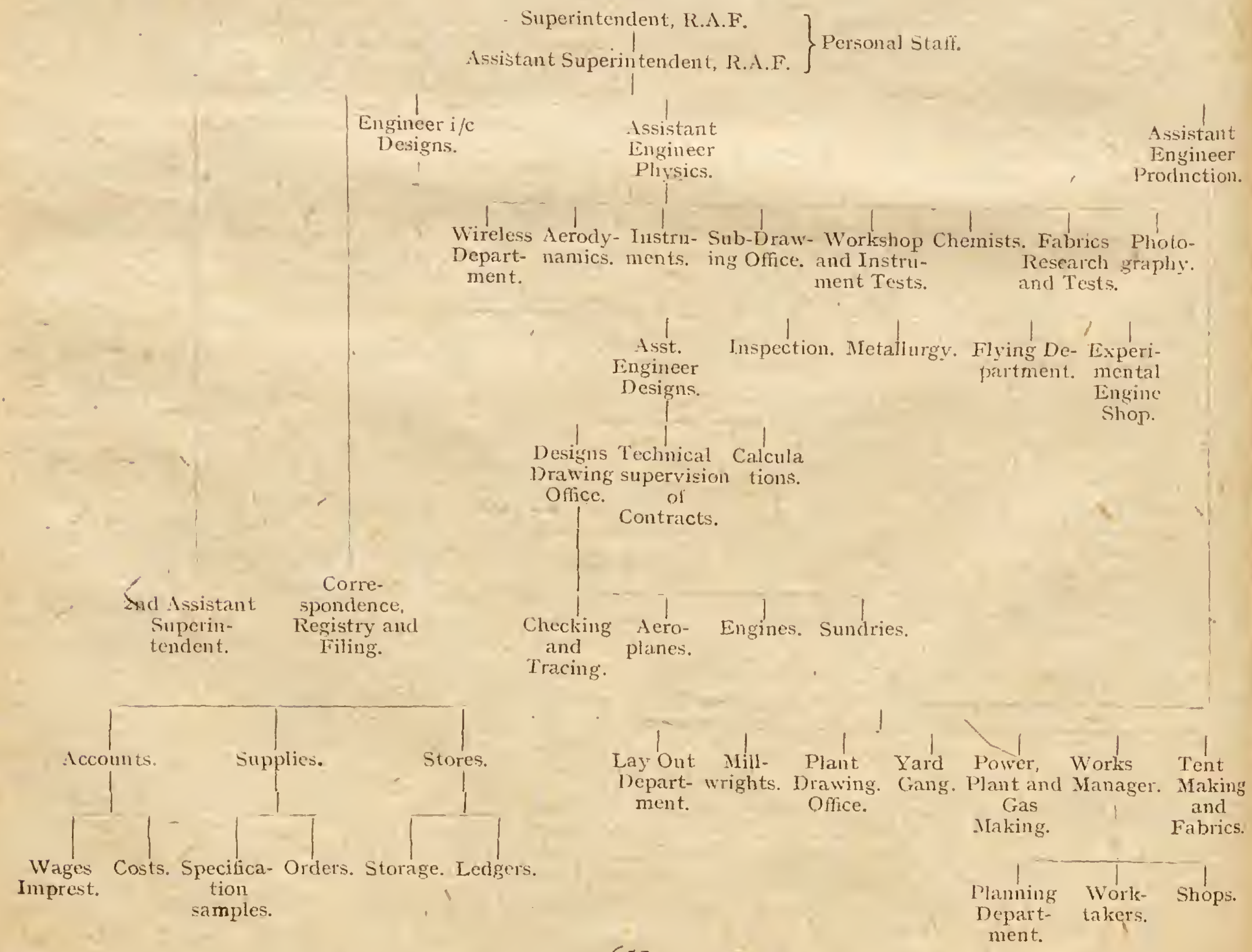
* See footnote on p. 650.

REPORT ON THE ROYAL AIRCRAFT FACTORY.

APPENDIX A.



APPENDIX B.



its recommendations they are not disposed to concur. I will deal with these cases in turn.

On page 650 appears a table of percentages of the "total absorbed by the various classes of work carried out in the Royal Aircraft Factory," the figures of which Colonel O'Gorman is stated to have checked. This table gives the percentage of the work of the Factory devoted to the "construction of aeroplanes" as 35 per cent.

The Board have heard Colonel O'Gorman's evidence in regard to this and have communicated with Sir Richard Burbidge on the subject. As a result of their inquiries, it appears that the figure of 35 per cent. accepted by Colonel O'Gorman represented "new experimental, construction, &c., services," and not "construction of aeroplanes." The proportion of the work which represents actual construction of aircraft is very much smaller, probably less than 10 per cent. This is a misapprehension which it appears very desirable to correct.

The diagram contained in Appendix A to the Committee's Report is also, whether owing to a printer's error or to other causes, inaccurate, and does not quite correctly represent the organisation of the Factory. A correct diagram is appended.*

As regards the measures which should be taken to improve the administration of the Factory, the Air Board have come to the following conclusions, which are in conformity with the recommendations of Sir D. Henderson, and in which they are hopeful that the Army Council will concur.

They do not share the view of the Committee that the Factory should be placed under a Board of Management. Such an arrangement, however suitable for a private factory, would in practice be found ill-adapted to the exigencies of military organisation.

They hold strongly that the Factory should be under the direction of a single Superintendent, possessing the special qualifications of business experience and administrative capacity required for the post.

Colonel O'Gorman has, in their opinion, rendered eminent public service in the design and construction of aircraft, and they think that these abilities can best be employed in the future in the capacity of Consulting Engineer to the Director-General of Military Aeronautics at the War Office.

Under the Superintendent, as now proposed, there should be a head of the Design branch and a head of the Production branch. Every effort should be made to obtain the persons best qualified for these posts.

The Air Board do not share the view of the Committee that a Military Adviser with distinctive executive duties should be attached to the Factory. The functions indicated by the Committee can, in their opinion, be better discharged by the Director of Aircraft Equipment at the War Office.

The Board share the view of the Committee that communication between the Royal Aircraft Factory and contractors should be reduced to a minimum. Such communications cannot be entirely suspended, as it is necessary for the Factory to buy materials, but it should not deal directly with those contractors with whom the War Office is in relation.

The Board do not, however, think it necessary to create a post of Controller of Aircraft Supplies for the purpose of acting as intermediary between the Factory and the contractors. These functions can be adequately discharged by the Department of Military Aeronautics at the War Office, as at present constituted.

The proposal of the Committee that the capacity of the Factory should be directed to an increase of the current manufacture of aeroplanes and engines, raises a difficult question. There is no doubt that from a financial point of view such extension is desirable. The larger the proportion of production to experiment, the more creditable will the balance sheet of the factory appear. On the other hand, not only does the present production of the Factory, limited as it is, arouse some measure of suspicion in the minds of private manufacturers, but any such extension in the case of engines is, under existing conditions, impracticable. An increased production of engines could only be obtained if new shops were built. But there is no room for their construction; and even if there were, no output could be obtained in less than 10 months. The object to be aimed at, in the view of the Air Board, is an increase in the output of aeroplanes by an improved organisation of the existing staff. No reduction should be made in the amount of experiment conducted at the Factory. On the contrary, this is the aspect of their work which it is desirable to emphasise by every possible means.

The Board have had under special consideration the question of increasing the output of engines by the trade. Much is being done in this direction, but the limiting factor is not financial assistance, which has not been stinted, but the lack of skilled mechanics. The Board have taken independent action in this respect.

The Committee have not dealt with the allegations, which have been made public, of defective internal administration of the Factory, such as that the workmen employed were inadequately employed or extravagantly paid. The Board have examined this point, but think it best that the complaints on these heads should be referred to the new Superintendent of the Factory, who should make it his duty, at an early date, to report upon them and to remedy any abuses which he may find to exist.

Any measures of reorganisation of the Royal Aircraft Factory should be adopted with the concurrence of the Air Board.

(Signed) CURZON OF KEDLESTON.

July 19th, 1916.

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* Appendix B.

THE R.F.C. INQUIRY.

AFTER having sat in private for several nights, the Committee inquiring into the administration and command of the Royal Flying Corps had a brief public sitting on July 26th.

Colonel Beatty was called in reference to an allegation that Captain Picton Warlow was allowed, or ordered, to fly an old machine which had ceased to be of any value in France, back to this country when the machine was in a dangerous condition to fly in.

Colonel Beatty said that he was present at headquarters when the officer started for England. It was not a question of a man being allowed or ordered to fly back, it was a privilege.

The machine was a two-seater Blériot with an 80 Gnome engine. It was obsolete for use in the field, but by no means obsolete for training purposes. The same type was, he believed, still in use.

He could not definitely recollect how long this actual machine had been in use. To the best of his recollection it was almost new. The type at that time was discarded because it could not climb the height required with a military load. If it was not a new machine, he could say quite definitely that it would have been overhauled. The day, December 20th, was a very good one, and he was told that England could be seen from the aerodrome.

It was clear, but slightly cloudy, with some wind. The machine was not used for field service, but was perfectly suitable for training purposes. The journey on which Captain Warlow started should have occupied not more than 1 hour 20 minutes. If a machine got into the clouds for five or ten minutes the best pilot might miss his bearings; or Channel mists might cause an accident.

The Chairman: When it was decided to discard types of machines which were outclassed by newer types, what was done with the discarded machines?—A machine which could be of real use for training purposes, whenever possible, was flown to England. If a machine was fit to fly across, then the pilot who was coming across was allowed to fly it.

Who decided as to the fitness of the machine?—The officer in charge of the repair section.

Was a test flight made, or was the machine overhauled?—Invariably it was tested to make certain that it would fly. Either the officer in charge of the repair section or the officer who was going to fly would test it.

It would go into the repair shop first of all, and then be tested, and if it was found fit to fly, the officer whose turn it was to come to England might fly it over?—He would get permission to do so.

Asked if he could explain how the accident happened, witness suggested that the officer might have got into a cloud and lost his bearings, and missed England altogether.

General Sir H. Smith-Dorrien: Are there any other occasions on which men have lost their way similarly?—I know a man who lost his way in a bad snow storm.

Witness added that in the early days of the war a pilot was lost in the same way.

Colonel Beatty read the proceeding of the Court of Inquiry with reference to the death of Captain Downer and Lieutenant Burrows, who were killed whilst flying a B.E. 4 machine, and respecting whose death allegations that they were due to faulty design or bad repair had been made. The evidence at the inquiry was that the machine was making an abnormally steep spiral descent when the strut broke.

In reply to the Chairman, witness said that they only tested the first machine of a type. As the others came along they were roughly tested by pilots in the air. The first machine of a type was put to very exhaustive tests.

The Chairman: Have you special pilots for that duty?—Yes, specially for that work.

Colonel Beatty said that contractors were given certain formula to which machines must approximate. A certain climb, speed, and load was specified—a practice which had only been instituted during the last year.

The Chairman: And you test the machines with reference to your specifications?—Yes.

Do you find that the machines substantially comply with specifications?—Yes, very closely.

The Committee then sat *in camera*. After the last private sitting on August 1st it was announced that the Report would be issued shortly.

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THE ROLL OF HONOUR.

In our last week's issue, by a most regrettable printer's transposition, eight names of officers who have been wounded were classified as "Missing." We express our sincere regret for this slip, and we now repeat the names as they should have appeared under their correct heading of:—

Wounded.

Lieut.-Col. H. C. T. Dowding, R.A., attached R.F.C.
Second Lieut. J. E. Griffith, Dorset Regt., attached R.F.C.
Lieutenant H. R. Hele-Shaw, Royal Flying Corps.
Captain J. U. Kelly, R.F.C. attd. Wilts Regt.
Captain T. E. Longridge, A.S.C., attached R.F.C.
Second Lieutenant W. G. Pender, Royal Flying Corps.
Captain J. C. Quinnell, R.F.A., attached R.F.C.
Lieutenant G. Thompson, Royal Flying Corps.

THE Secretary of the Admiralty announces the following casualties:—

Killed.

Flight Sub-Lieutenant Ian N. Carmichael, R.N.

Died of Injuries.

Prob. Flight Sub-Lieutenant William R. Wallace, R.N.

Slightly Wounded.

Flight-Lieutenant Edward H. Dunning, D.S.C., R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Second Lieutenant J. Godlee, Royal Flying Corps.
Second Lieutenant R. W. Settle, Royal Flying Corps.
Second Lieutenant G. N. Teale, Royal Flying Corps.

Died of Wounds.

Second Lieut. J. L. Reid, Northumberland F., attd. R.F.C.
351 Sergeant T. F. J. Carlisle, Royal Flying Corps.
7131 2nd Class Air-Mechanic F. E. T. Sanders, R.F.C.
6261 2nd Class Air-Mechanic J. Simpson, R.F.C.

Wounded.

Captain R. Blatherwick, R. Scots Fusiliers, attd. R.F.C.
Second Lieut. C. V. J. Borton, Norfolk Regt., attd. R.F.C.
Captain M. G. B. Copeman, Leicestershire and R.F.C.
Second Lieut. D. H. S. Davies, R. Warwickshire and R.F.C.
Lieut. B. McL. Hay, Canadian Engineers, attd. R.F.C.
Second Lieutenant F. G. Hogarth, Royal Flying Corps.
Second Lieutenant R. Holloway, Royal Flying Corps.
Second Lieut. H. S. Macneil, R.F.A., attd. R.F.C.
Second Lieutenant J. Manley, Royal Flying Corps.
Lieutenant E. R. Manning, Hussars, attached R.F.C.
Second Lieutenant L. L. Richardson, Royal Flying Corps.
Second Lieut. C. G. Riley, Royal Fusiliers, attd. R.F.C.
9138 2nd Class Air-Mechanic W. R. Morton, R.F.C.

Correction: **Wounded.**

Second Lieut. W. E. Birch, E. Lancs. Regt., attd. R.F.C., should read
Second Lieut. W. E. Birch, S. Lancs. Regt., attd. R.F.C.

Missing.

Second Lieutenant R. M. W. Browne, R.F.C.
Lieut. N. A. Browning-Paterson, R.A., attd. R.F.C.
Lieut. H. Clements-Finnerty, Lancers, attd. R.F.C.
Captain J. O. Cooper, Royal Flying Corps.
Lieutenant H. R. Hele-Shaw, Royal Flying Corps.
Second Lieutenant D. S. C. Macaskie, Royal Flying Corps.
Second Lieutenant R. C. Oakes, R.F.A., attd. R.F.C.
Lieut. A. V. Oliver-Jones, R.F.A., attd. R.F.C.
Second Lieut. A. H. W. Tollemache, R.E. and R.F.C.
2458 Corporal R. G. Johnstone, Royal Flying Corps.

Correction: **Missing.**

Lieutenant J. L. Whitby, Leinster Regt., attached R.F.C., should read—Lieutenant J. L. Whitty.

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Germany's Aerial Champions.

AN announcement by the German War Office states that the ten most successful German aviators with their records of hostile machines brought down are: Captain Bölke, 19; Lieutenant Immelmann (dead), 15; Lieutenant Wintgens, 11; Lieutenant Höhndorf, 10; Lieutenant Parchau (dead), 8; Lieutenant Mulzer, 8; Lieutenant Baron von Althaus, 8; Lieutenant Leffers, 5; Lieutenant Walz, 4; Lieutenant Gerlich, 4.

Lieutenant Parchau, who was recently decorated with the Order Pour le Merite, was killed in a fight with a British machine on July 24th, being shot through the heart. The machine, it is said, fell into the German lines.

Zeppelins Patrolling the Jutland Coast.

REPORTS from various places in Jutland report the passing of Zeppelins each day during the past fortnight. On July 27th one was observed patrolling between the island of Romo (Prussia) and Horns Reef for two hours, when it disappeared in a westerly direction. No doubt a dual purpose is being served by this journeying about—practice for visits to hated Britain's shores and scouting for the cooped-up German Navy.

Zeppelins by the Dozen.

ACCORDING to the *Morning Post* correspondent at Stockholm, reports from Gothland indicate that the fleet of 12 Zeppelins which passed to the east of that island on the night of July 27th headed for the Gulf of Finland, as it was observed that a somewhat easterly course was taken by them. The airships travelled partly in couples and partly in single file. It is supposed that they were fired on by warships, as soon after they had passed Gothland, heavy firing was heard in the direction in which they had gone. A telegram from Landsort states that on July 28th a Zeppelin, supposed to be one of the same fleet, was seen close to the Swedish shore, evidently making for Aland. The *Dagens Nyheter* is of opinion that the main body of the airship fleet was making for the Russian naval base in the Gulf of Finland, and that while each unit had a definite goal they were all co-operating with the view of damaging the Russian ships and fortifications and breaking the power of the Russian naval offensive in the Baltic.

A Zeppelin Record.

WRITING on July 29th the *Morning Post* correspondent at Stockholm says:—

"A message from Landsort states that a Zeppelin, which was sighted last night on its way north, passed here at 11 a.m. to-day, heading south. The same telegram states that the airship visited Aland Island, where it was fired at, but escaped unhurt. The Swedish newspaper *Aftonbladet* makes a calculation as to the time and distance covered by the airship on this voyage in comparison with the time and distance of the airship raids on England, and arrives at the conclusion that a new record has been established in this instance."

AIRISMS FROM THE FOUR WINDS.

PILOT L. L. KING, of the Beatty School, has recovered from his rather nasty accident of a short while ago, and had the pleasure of taking Mrs. Beatty up for her second flight in England on Friday.

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THE Smiles-Sykes looping contest runs apace. Sykes is now in the fifties, and Smiles, stealing various marches on his opponent, now totals one hundred and sixty-one.

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CURIOUS that neither the Martinsyde nor the L. and P., the two 'buses referred to above, will tail-slide. Both appear to stand on their respective tails whilst the weight of the engine pulls the nose of the machine earthwards.

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"SMILES' double two" is not, as might be supposed, a telephone number, but has reference to the record put up by pilot G. M Smiles, on the L. and P. On Tuesday of last week he looped the loop 22 times in succession, In the face of such a whirling, his twelves and fifteens sink into the commonplace.

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THE P.B. "Sparklet" was sparkling in the sunlight again on Sunday.

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AN out-and-home sporting contest between the "Sparklet," the de Havilland, the Bristol "Bullet" and the Sopwith would be an event worth watching. Is it possible?

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CATTLES have now taken premises in Kilburn, near Cricklewood Lane. Worth noting, seeing the way things aviatic are drifting Hendonwards. Also convenience in quick delivery, owing to proximity of works, is something in these days of hustle.

PILOT-INSTRUCTOR OSIPENKO is making satisfactory progress after his very nasty crash of two weeks ago. Unfortunately, his legs are pretty seriously damaged, and recovery must of necessity be slow. We tender him best of wishes.

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THE opening of the Princess's Theatre at the Vickers' village at Crayford by Princess Christian on July 26th, when the Princess was received by Mr. Albert Vickers, the chairman of the company, reminds one that the Vickers' firm are ever alive to the happiness of those around them, this being but one instance of the care which the directors of Messrs. Vickers, Ltd., have for the welfare of their employees. Not only have they already in operation a similar theatre at Walney Island, where first-class music may be heard and first-class plays and films seen, but at the Vickers' aeroplane works at Weybridge there is a canteen, which in 10 minutes can be transformed into a picture theatre with stage and all complete, and can be changed back to a canteen in a similar space of time.

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EVER mindful of their clients' requirements, Messrs. Robinson and Cleaver, the Naval and Military tailors, of Regent Street, have thoughtfully produced a useful little clip case for boxes of safety matches. The clips, which are made in oxydised metal, have an embossed Air Service badge on the side.

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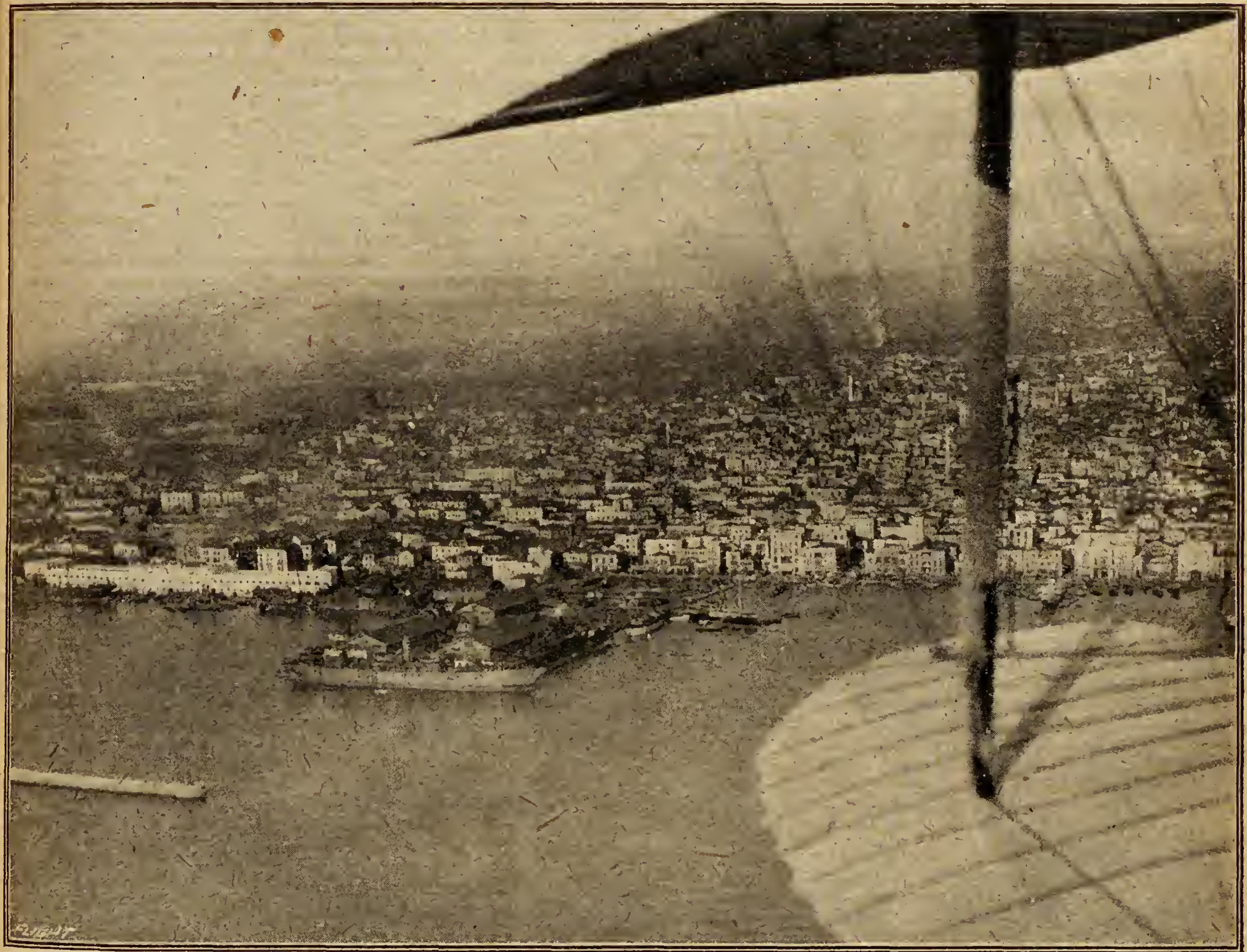
ON Sunday, with the thermometer registering well over the hundred mark, two Naval pilots had a welcome ducking in the waters of the "Welsh Harp." The machine, an Admiralty B.E., shed a wheel, unknown to the pilot, on



WITH THE BRITISH FORCES IN SALONICA.—The city, as seen from a British seaplane flying over Salonica Bay. *(Official photograph issued by the Press Bureau.)*

taking off at Hendon. When descending for *terra firma* some minutes later, he was made aware of the state of things by those in the aerodrome hurling frantic signs at him, whilst waving the roving wheel aloft. Returning "upstairs" to think matters over, the pilot chose the lesser of two evils, and made a beautiful *vol plané* into the Brent Reservoir. Pilot and passenger escaped with nothing worse than an impromptu swim, and the machine was quickly towed to the side, practically undamaged. Although aeroplanes are prohibited using the Brent Reservoir for purposes connected with aviation, probably the authorities will also think matters over before taking action on the present occasion.

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THE spectre of "Professional Jealousy" hid itself behind the sheds and looked round the corner, when a neat little act of good fellowship was enacted by the British Caudron company at Hendon on Sunday. An A.I.D. officer had occasion to proceed to Farnborough to stamp an Aircraft company's machine leaving for overseas at once. Hendon to Farnborough on a Sunday afternoon by railway is *not* the most convenient form of recreation. With a promptness which heightened the good feeling existing, Director A. M. Ramsay placed one of his new Renault Caudrons, with René Desoutter as pilot, at his disposal. Judging by the faces of the two on returning, the trip must have been most enjoyable, and those of us sweltering on the ground longed for the opportunity of such a cooler, only more so.

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THE new Beatty monobloc four, 50/60 gives 63, on the bench, and turns over at 1,800. It has now run for 27 hours without trouble, and hardly any vibration. But more of this next week, possibly with photographs.

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MR. H. AUSTIN is one of the members of the Committee appointed by the Minister of Munitions to draw up a scheme for workers' holidays.

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PETROFIN is the name of a new white oil which is being offered by the Anglo-American Oil Co. for use in bi-fuel carburettors.

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AIRCRAFT and their work are responsible for the bringing to light many legal anomalies. In the House of Lords last week it was held that there is no obligation upon a company—to wit, the Great Central Railway Co.—to illuminate in these nights of darkened streets the posts in the roadway approaches to their stations to a degree sufficient to enable a driver to avoid a collision. The judgment came about in the case of an appeal against a decision of Mr. Justice Darling and the Court of Appeal. A taxi-cab driver sued the company for negligence in view of the darkened streets for not painting the gateposts at Marylebone Station white and placing lanterns on them.

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THE Freshfield Building Estate, Millbrook, Southampton, was recently advertised for sale by auction in "FLIGHT." From the auctioneer, Mr. Wiliam B. Hill, we learn that the property changed hands at a satisfactory figure. It is a good district for aeronautical constructors.

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MR. CHARLES LE MAISTRE, A.M.Inst.C.E., M.Inst.E.E., who has been in charge of the work of the Electrical Section of the Engineering Standards Committee since 1903, has been appointed secretary to the Committee in succession to the late Mr. Leslie S. Robertson, M.Inst.C.E., who was lost with Lord Kitchener in the disaster to H.M.S. "Hampshire" whilst on an important Government mission.

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THE "Bad for the Coo" opposition to the locomotive saying of Stephenson's has again been, in a way, simulated in connection with aircraft. An aeroplane presented by the Indian Rajahs was compelled to descend at Chertsey owing to engine trouble whilst on a journey from the Midlands to France. The wing was slightly damaged, and the propeller broken in a remarkable manner. A dog dashed at the propeller as the machine was running along the ground at high speed, and was instantly killed, whilst the propeller was smashed.

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THAT was a curious, not to say unpleasant, experience which is reported from Harborne last week, when an aeroplane in flight came in conact with a flock of pigeons. The propeller was broken, and the machine forced to descend close to the main road. Luckily neither the airman nor the observer was hurt.

Dogs and pigeons should, indeed, be a bit more circumspect.

A SIGN of the times and a chance for relic hunters is to be found in the following advertisement which appeared in the *Times* on July 27th :—

"ZEPP.—RELICS and Parts of Framework of recently captured ZEPPELIN, to be SOLD separately. Existing offer £45 for framework. Highest offers.—Box T. 183, the *Times*."

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WHAT, we wonder, think now the wise critics of days agone who would have it that looping the loop was a mere acrobatic senseless, and useless circus performance. An illuminating sidelight upon its possibilities emerges in a paragraph in the R.N.A.S. report of the "incident" on July 15th, when one of our aeroplanes successfully downed a German seaplane. And this is how he did it : "The enemy manœuvred for a position behind and below the Nieuport, both machines meanwhile executing a steep glide. The British pilot thereupon looped over the enemy, who passed underneath him. He thus gained the desired position behind and opened fire into the seaplane at a range of 100 yards. The German pilot, who was evidently hit, made a vertical nose-dive. The machine was last seen in flames, falling headlong downwards."

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CONGRATULATIONS to Second Lieutenant McCubbin on his D.S.O. for putting up the number of the German Fokker crack, Immelmann.

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THE latest stunt aviatic of the Germanic combination is the establishment of a "Balkan Aerial Express" from Berlin, via Vienna and Budapest to Constantinople. Good luck to the enterprise, as, if it is carefully carried out, it should presently come in very handy for the Allies as a ready-made organisation for the easy communication of our army of occupation in the Central Empires.

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"THE R.F.C. have carried out several bombing raids and dropped seven tons of bombs on the enemy's communications and billets."—*General Headquarters (France) report, July 31st.* Not so bad, and there was lots more air work in the same despatch, for what is described as "a quiet day" !

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WELLS AVIATION CO. DEVELOPMENTS are looming large. Already their workers total over the half thousand, and more extensions still are on the way—Chelsea way. And not satisfied with this, the company are shortly blossoming forth in the country near to that delightful town Chichester. They will probably need all the space they can get, as in addition to their Government work and the Benoist boat agency, they have taken over the representation of the well-proved Roberts aviation engine. Messrs. Wells, Doyle Jones, and their co-workers, have reason to be proud of the outcome of their joint efforts out of such very small constructional beginnings.

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TIME is money is an old adage. Probably no truer word has ever been spoken. By accurately recording time in a factory, small or large, it is astounding what, at the end of a year, a difference is totted up in wages earned or lost by the neglect of that daily few minutes, which doesn't matter, so the slacker maintains. In times old-fashioned it was held that the recording of these unconsidered trifles off working hours cost more than the amount saved thereby, justified. And we are not sure the "ancients" were not right. Now that is all changed, and the wonderful automatic time recorders which every up-to-date establishment should have as one of its first requirements, does the whole business, as it were, on its own. No cost but the prime cost, and these machines save this in a fraction of time by their accuracy in action, whilst another "compensator" of no mean order is that, however convinced a man may be that he *was* "on time," when the clock recorder vouches for his time all dispute vanishes, all of which leads to harmony between employer and employee. Time was when British makers knew nothing of these. *Now* the Gledhill-Brook time recorders standing out as "all British" receive the respect from foreign makers which all high-class work must command. There may be firms in association with aviation still without one of these indispensables, in which case we would strongly recommend a communication to the Gledhill-Brook firm at either 26. Victoria Street. Westminster. 43. Market Street. Huddersfield, or at 44. Hill Street. Birmingham.

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ANOTHER accession to those making Aircraft Fittings and Components is the Osborne and Creighton Aircraft Company of 33, Chatham Road, Norbiton, Surrey. Contractors and sub-contractors should note and communicate with the firm.

Personals

Casualties.

Second Lieutenant Cecil Henry Coxe, R.F.C., aged 18, was the youngest son of Mr. H. R. H. Coxe, formerly of the Indian Civil Service. He was educated at Bilton Grange, Marlborough, and Balliol, where he gained a History Exhibition in December, 1914. On attaining his eighteenth year he applied for a commission in the R.F.C., which he obtained in December, 1915. He gained his "Wings" in May, and went to the Front at once. On July 1st he was sent with a detachment to attack a railway centre in rear of the German lines. On his return, after carrying out his orders, he was shot down, and died the same day in a German field hospital.

Lieutenant A. V. Oliver-Jones, R.F.A., attached to Royal Flying Corps, who was reported missing, it is now announced, has been killed during an air raid. He was acting as observer on an aeroplane that was hit by anti-aircraft guns, and fell 9,000 ft. He was well known in Tunbridge Wells, where his relatives reside. Early in the war Lieutenant Oliver-Jones was seriously injured in the hand by an explosive.

Second Lieutenant Reginald William Settle, R.F.C., who was killed on July 23rd while flying over the German lines, was the eldest son of Mr. and Mrs. Joel Settle, The Hill, Alsager. He was educated at Elleray Park, Wallasey, and Radley College, Oxford. Mr. Joel Settle, who is the managing-director of the firm of Messrs. Settle and Speakman, colliery agents and factors, is well known in commercial circles in Birmingham and the Midlands. Second Lieutenant Settle, who was 25 years of age, joined the Motor Transport Section as a private in November, 1914. He was engaged in driving the motor car of Sir William Robertson when he was Quartermaster-General, and afterwards when he was Chief of the Staff. On General Robertson's return to England, Second Lieutenant Settle, who had been promoted to sergeant, was given charge of the motor cars of General Sir Douglas Haig at his headquarters. He obtained a commission in the R.F.C. in June.

Lieutenant Guy Neville Teale, R.F.C., killed on July 20th, aged 19, was the only son of Mrs. Teale, of 37, De Vere Gardens, W. He was born in 1896, and educated at Charterhouse. On the outbreak of war he enlisted in the Public Schools Brigade, obtaining a commission in the 8th Buffs in November, 1914. In April, 1915, he transferred to the R.F.C., and took his wings in June of that year. In November he went to France with a squadron. A few days before his death, on promotion, he was transferred to another squadron, on which occasion his squadron commander wrote: "He has done me awfully well, and has put up some splendid shows. One of his best efforts was just before he left. He went on a night bombing expedition and came down to 300 ft. to attack a searchlight which was turned on him. They fired on him very heavily, hitting his machine and engine . . . but he defeated them and put out the light with machine-gun fire. It was an excellent show, and one of which he and his observer may be very proud." He had been promoted Flight-Commander and Captain, although he had not yet been gazetted. On his death the commander of his squadron wrote: "It may perhaps help you a little to bear his loss when I tell you that the duty on which he was killed was one for which he had volunteered."

Captain Dawyck Moberly Veitch, 1st D.Y.O. Lancers, attached to R.F.C., was the younger son of the late Andrew Veitch, of the Hongkong and Shanghai Bank. He was educated at Bedford Grammar School, and at Uppingham. He was on leave in England when war broke out, and went out to France attached to the 9th Lancers early in September, 1914, and in the November was transferred to the 4th Dragoon Guards. He was invalided home in December, 1914, and in January, 1915, joined the R.F.C. as Observer. In February, 1916, he was asked to qualify as a pilot, and after some months' work in England returned to France on June 28th. While he was flying on a reconnaissance on July 8th both wings of his machine were blown off, and it is believed he was killed.

Lieutenant John Leo Whitty, Leinster Regiment, attached R.F.C., officially reported missing, is now stated to have been killed by an anti-aircraft shell during a reconnaissance over the enemy's lines on July 8th. Born at Cape Town in 1894, he was the third son of Lieutenant-Colonel M. J. Whitty, R.A.M.C. He was educated at Castleknock, and the Jesuit College, Liverpool, and was gazetted from Sandhurst to the Leinster Regiment in February, 1913. He joined the 1st Battalion at Fyzabad in the following September, and after the outbreak of war returned with it from India to France. He was wounded at the retaking of the village of St. Eloi on March 15th, 1915, in which action the 1st Leinster Regiment especially distinguished itself. He was highly commended for his coolness and courage in every emergency, and was mentioned in Despatches, and awarded the Military Cross the following June. His three brothers are at the Front.

Wounded.

Second-Lieutenant T. H. M'Dowell, R.F.C. who was recently severely wounded in the shoulder by shrapnel, was a son of Mr. Thomas M'Dowell, Helen's Bay (of Messrs. Dunville's), and joined the Army originally as a despatch rider. He was subsequently gazetted to a commission in the Royal Garrison Artillery, and transferred last February to the Flying Corps. He was in hospital for several weeks, but has made a good recovery.

Missing.

Mr. and Mrs. A. E. Wilson Browne, of The Crag, Sutton Coldfield, have been notified that their son, Second Lieutenant Roland Murray Wilson-Browne, R.F.C., is reported missing. Second Lieutenant Wilson-Browne, who is 19 years of age and obtained his "Wings" at the beginning of last May, was educated at Solihull Grammar School and King Edward's School, Birmingham, and distinguished himself at the latter place by winning the gymnastic championship in three successive years. A brother officer, in a letter to Second Lieutenant Wilson-Browne's parents, states that he went up on a bombing raid on July 21st and did not return, but when last seen was descending with his machine under control. It is therefore assumed that he has been taken prisoner.

Married and to be Married.

The marriage of Captain Vivyen Davies, A.S.C. (attached to R.F.C.), and Enid, only daughter of Mr. and Mrs. Wareham Smith, of 91, Upper Tulse Hill, S.W., took place on Tuesday last at St. Bede's Church, Clapham Park.

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QUESTIONS IN PARLIAMENT.

Air Service Requirements.

Mr. Peto, on July 25th in the House of Commons, asked the Minister of Munitions if he is satisfied that all the establishments controlled by his Department which manufacture any of the requisites for the Air Service are fully engaged; whether any such establishments have repeatedly asked for further orders and obtained no reply for many weeks, and then of a negative or delaying character; and whether he will consider the establishment of a travelling supervisor of Air Service work, with a view to obtaining the maximum results?

Major Baird (representing the Air Board): Establishments engaged on aircraft work are as a general rule employed to their full capacity, the object aimed at being to place new orders a sufficient time in advance of the completion of the previous contract to enable all material to be obtained for commencing work on the new order as soon as the old order is completed. It is not, however, practicable in all circumstances to adhere to this rule, as to do so would often involve giving orders for aircraft of types already becoming obsolete in preference to newer types which may be under consideration or trial. I am not aware of any cases such as are suggested in the second part of the question, but if my hon. friend will bring any such to my notice, inquiry will be made into them. The Admiralty and War Office already have travelling officers to supervise contract work on aircraft, and it is not considered that the creation of an additional travelling officer would serve any useful purpose.

Royal Aircraft Factory.

Mr. Brookes in the House of Commons on July 31st asked the Secretary of State for War what action he proposes to take on the Report of the Committee of Inquiry into the Royal Aircraft Factory at Farnborough?

Major Baird (representing the Air Board): The action which it is proposed to take will be on the lines indicated in the Report of the Air Board to the War Committee which was recently published with the Report of the Committee of Inquiry.

Protection Against Enemy Air Raids.

Mr. Brookes asked whether, in view of the possibility of further enemy air attacks on this country during the autumn, steps have been taken to complete the air defences of the country; and whether perfect co-ordination now exists between all branches of the two Services?

Major Baird: The development of the air defences of the country has made great progress, and is proceeding as rapidly as the manufacturing output and the needs of our forces abroad permit. In regard to the second part of the question, the hon. Member may rest assured that all possible steps are taken to secure co-ordination between the various branches concerned.

The Flying School at Simla.

Mr. W. Roch asked whether a scheme for a Flying Corps was prepared by the staff at Simla prior to the war; and, if so, whether such scheme was put into force?

Mr. Chamberlain: The establishment of a flying school was sanctioned in 1913. A few machines were supplied, and additional machines were on order when war broke out. Both the machines and the personnel were then transferred to the War Office at their urgent request.

The Air Service in India

Mr. Walter Roch asked the Secretary of State for India how many Army aeroplanes were in India at the outbreak of war?

Major Baird: I shall be happy to supply this information to the hon. Member privately, but I do not think that it would be in the interests of the country that the number should be publicly stated.

Mr. Pringle: On what ground should it not be publicly stated now, nearly two years after the outbreak of the war?

Major Baird: On the ground that it is contrary to the public interests to make any statement in regard to our preparations for war.

Mesopotamia Aeroplane Force.

Mr. Roch asked the Secretary for India how soon after the landing of our troops in the Persian Gulf our Army was supplied with an aeroplane force?

Major Baird: This matter forms part of the larger question of the equipment of the Mesopotamia Field Force, which is to be the subject of inquiry by a Special Commission. I do not think that it can be satisfactorily dealt with in an answer to a Parliamentary question.

Air Raids and Lighting Regulations.

Mr. Bennett-Goldney asked the Secretary of State for the Home Department if his attention has been drawn to the strict manner in which the lighting regulations are enforced in certain areas and to the lax manner in which they are barely enforced in others, even approximately, close to them; if it is realised by the authorities that many central street lamps in the streets of London are permitted to reflect large brightly-illuminated patches on the roads, that such lights are easily seen from above, and that they render the finding of certain localities less difficult; whether, now that the time of year is fast approaching when Zeppelins are most likely to indulge in their activities, he is aware that certain top windows of the Foreign Office have been recently allowed, in the neighbourhood of the official residences, to be brilliantly illuminated without blinds being drawn; whether his attention has also been called to the virtually unscreened lights permitted at Wellington Barracks, while similar lights are not permitted either in the neighbouring palace or in private houses; and whether he will consider the possibility of arranging for greater uniformity both in restrictions and permissions?

Mr. Samuel: Where the local authorities are so many and the methods of illumination so various as in the Metropolitan area it is extremely difficult to secure complete uniformity, but numerous experiments have been made as to the best method of obscuring street lamps so as to obtain an approximation to uniformity and to prevent undue illumination of the ground. Measures are now in contemplation for the introduction of certain improvements in the existing arrangements. Bright, unscreened lights are not allowed at the places mentioned, and, if they are observed, steps will be taken to deal with the matter.

Lord Hugh Cecil: Is great care taken to ascertain the opinion of those who are expert aviators as to what is visible and what is not?

Mr. Samuel: The police are in constant communication with those who have got experience.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), July 27th, 10.15 p.m.

"Some good work was accomplished by the Royal Flying Corps on the 26th in locating the enemy batteries and newly-constructed defences. Owing to the clouds and mists our machines had to fly low, and two of them are missing."

General Headquarters (France), July 28th, 10.15 p.m.

"Two hostile aeroplanes were destroyed by one of our aerial patrols in the neighbourhood of Bapaume yesterday."

General Headquarters (France), July 29th, 10.30 p.m.

"Three enemy aeroplanes were destroyed yesterday, and a German kite balloon was seen to fall in flames."

General Headquarters (France), July 30th, 11.12 p.m.

"Three hostile aeroplanes were destroyed yesterday, and several others were forced to land in a damaged condition."

General Headquarters (France), July 31st, 10.15 p.m.

"The Royal Flying Corps have carried out several bombing raids, and dropped seven tons of bombs on the enemy's communications and billets.

"In one case a train was blown up, in another an ammunition depôt was set on fire, and a hostile aeroplane on the ground was destroyed.

"There were many aerial combats, and several enemy machines were driven to the ground in a damaged condition.

"Three of our machines are missing."

French. *Paris, July 25th. Afternoon.*

"On July 22nd Sub-Lieutenant Nungesser brought down his tenth German aeroplane.

"During the night of the 24th–25th one of our air squadrons bombarded the railway stations of Pierrepont and Longuyon and some bivouacs near Mangiennes."

Paris, July 26th. Afternoon.

"During the night of July 25–26th one of our air squadrons dropped forty bombs of 110 mm. and two of 200 mm. on the military establishments at Thionville and Rombach, after which the squadron set out again before dawn to bombard an important munition depôt near Dun. Thirty-eight bombs were dropped on this objective. The same night 29 bombs were dropped on the stations of Vilosnes and Brieulles and bivouacs near Dannevoux."

Paris, July 27th. Evening.

"At about 10.45 this morning three enemy aeroplanes dropped bombs on Crédy-en-Valois. Three women were wounded and one girl was killed."

Paris, July 28th. Afternoon.

"In the course of yesterday our pursuit aeroplanes were engaged in numerous fights. Two German aeroplanes were brought down in the region of the Somme, one near Brie, and the other in the neighbourhood of St. Christ. A third enemy machine was attacked by one of our aeroplanes and brought down at Vrille, to the south of Ornes (region of Verdun). A German Aviatik machine attacked in the Vosges and forced to abandon the fight, overturned in landing.

"On the night of July 26th–27th one of our air squadrons dropped heavy calibre bombs on the railway lines to the north of Tergnier, on the station of Chauny, and on enemy convoys on the road in the neighbourhood of Coucy. Our aeroplanes also bombarded between Laon and Rheims the military establishments at Menneville and Lavannes-Caurel."

Paris, July 28th. Evening.

"This morning our aeroplanes pursued a German air squadron in the region of Verdun. Several fights took place, in the course of which one of the enemy machines was forced to come down in our lines. The two officers who were in it were taken prisoners."

Paris, July 29th. Afternoon.

"In the morning of July 27th a French aeroplane, piloted by Qr.-Mr. de Terline, attacked a German machine which was flying over Chalons. The French pilot had just opened fire when his machine-gun jammed. The enemy was in full flight. Two of our machines then saw Qr.-Mr. de Terline swoop upon his adversary at full speed, crash into him and fall with him to the ground. The French pilot and the two German airmen fell within our lines and were killed. Qr.-Mr. de Terline had already brought down two enemy machines, and had just received the Military Medal.

"In the region of Amiens our pursuing aeroplanes fought 34 battles, in the course of which five enemy aeroplanes were forced to land in a damaged condition. A sixth German aeroplane was brought down between Chaulnes and Roye.

"In the night of July 28th our bombarding squadrons carried out a number of operations; 207 shells in all were dropped on bivouacs, depôts and railway stations on the enemy's front."

Paris, July 30th. Afternoon.

"Yesterday our machines were engaged in 11 fights on the Somme front. Three German machines were brought down, and a fourth machine attacked by one of our aeroplanes was dashed to pieces within the German lines in the Argonne. It is confirmed that one of the German machines previously reported as seriously damaged in the course of the aerial fighting on the Somme front was, in fact, brought down by Second Lieut. Guynemer, who thus brought the number of German aeroplanes which he has driven down to 11. In the course of Saturday night 40 bombs of 120 kilos. were dropped on enemy railway stations in the Noyon district. This morning one of our bombarding squadrons dropped several heavy bombs on the railway station and military establishments at Mulheim (right bank of the Rhine)."

Paris, July 31st. Evening.

"During the night of July 30th–31st one of our squadrons bombarded the military factories of Thionville, the stations of Conflans and Audun Le Roman, as well as bivouacs in the region of Etain."

Russian. *Petrograd, July 25th.*

"Two German aeroplanes flew over our positions in the district north of Lutsk and threw some bombs, but without causing any damage.

"On July 24th, to the west of Burkanow (on the Strypa), at about 8 o'clock in the evening, one of our aeroplanes was hit by the enemy's artillery fire, caught fire and fell in the enemy's front line. It is supposed that the gallant aviators, Staff Captain Berize and Lieutenant Ritcheff, perished as heroes."

"*Caucasus.*—The Turkish armies are retreating in disorder before the irresistible pressure of our troops, some of whom are already only 10 miles from Erzingan, in which, according to the reports of our aviators, the Turks are hurriedly piling together all kinds of provisions."

Petrograd, July 26th.

"Six enemy airmen threw 32 bombs on Zamiri Station. Eleven aeroplanes also threw 71 bombs on the station of Pogorjelze."

Petrograd, July 27th.

"On July 25th at 2 o'clock in the afternoon a Zeppelin dropped some 15 bombs in the mouth of the Gulf of Finland, and on the outskirts of the town of Abo (on the Aland Islands) without causing any damage to the ships or on shore. Being fired at by our batteries, the Zeppelin withdrew in a southerly direction.

"On the same day eight enemy seaplanes attacked our seaplane station, dropping about 100 bombs. Two of our seaplanes which engaged the enemy in battle succeeded in hitting one enemy machine, which caught fire."

Petrograd, July 28th.

"In the region of Krevo our artillery brought down an enemy aeroplane, which fell in his own lines."

Petrograd, July 29th. Afternoon.

"Yesterday a squadron of 10 of our aeroplanes made a successful raid on Baranowitschi."

"North of Lake Miadziol, Lieut. Tomson, flying a Nieuport machine, chased an enemy Albatros which was flying over the township of Vudslaff and pursued it as far as Kobylniki, where the Albatros disappeared in a north-westerly direction, while Lieut. Tomson, after having subjected an enemy camp near the Kobylniki aerodrome to the fire of his machine gun, returned safely to our lines."

Petrograd, July 29th. Evening.

"Hostile aeroplanes flew over the region of Loguischin and Manewitchi Station, where they dropped some bombs."

Petrograd, July 30th. Afternoon.

"Over 12 German aeroplanes made a raid on Dwinsk, dropping about 40 bombs. Twelve of our machines, in spite of enemy fire, engaged the German aeroplanes, and pursued them, the latter taking to flight. Cavalry Capt. Kosakoff, attached to the Flying Corps, overtook one of the German machines, and after a fierce encounter brought it down. We had no losses. One of our air squadrons bombarded the railway station of Jelowka. East of Baranowitschi we brought down an enemy aeroplane. We captured the enemy aviators, who belonged to the 35th German Air Detachment. The machine was burnt."

Petrograd, July 31st.

"Enemy aeroplanes have dropped bombs on the stations at Zamire and Isiaslav."

Italian. *Rome, July 25th.*

"Early in the morning of the 24th hostile aircraft dropped bombs on S. Giorgio di Nogaro and other places of the Lower Isonzo. No harm was done, except that one farmhouse was burnt."

Rome, July 26th.

"In the Trevignolo Valley our aircraft bombarded the enemy parks and depôts at Bellamonte."

Rome, July 28th.

"Our aircraft renewed the bombardment of enemy parks at Bellamonte.

"Hostile aeroplanes yesterday dropped bombs on Bari, Mola di Bari, Molfetta, and Otranto. At Bari there were only two wounded, at Molfetta five persons were killed and 20 wounded, while at Otranto there were no victims and no damage was caused.

"Some persons were slightly injured at Mola di Bari, and a few buildings suffered trifling damage. Despite the fact that the hostile machine flew at a great height, some were hit by the fire of our batteries."

Rome, July 29th.

"On the Carso one of our squadrons bombarded the enemy's camp and park in the Appacchiasella region. Hostile aircraft, which counter-attacked, were driven off, one of them being brought down in flames."

German. *Berlin, July 25th.*

"Lieutenant Baldumus shot down a French biplane south of Binarville, thus putting his fourth enemy machine out of action."

Berlin, July 26th.

"Two enemy aeroplanes were brought down in our lines north of the Somme by infantry and machine-gun fire. One fell to earth in a burning condition after an aerial fight near Lunéville. On Monday a French biplane was shot down in the direction of Fort Souville by a direct hit from our anti-aircraft guns.

"By means of bombs and machine-gun fire our airmen brought enemy transport trains to a standstill on the line Dvinsk–Polotsk and east of Minsk.

"German air squadrons abundantly and successfully bombed the railway stations at Pogoryeltsy and Gorodyeya (on the Minsk line), which were full of troop transports. Bombs were also dropped on troops camping near by.

"Yesterday evening one of our seaplane squadrons attacked and bombed the Russian aerodrome at Zerel, on the Island of Oesel (Gulf of Riga). The aeroplane sheds and Russian aeroplanes ready to ascend were hit. In spite of bombardment by enemy torpedo-boats and battle aeroplanes, the attack was carried through according to plan, and all our airmen returned to their bases.

"On July 24th, in the afternoon, north of Zeebrugge, a British biplane was shot down by one of our submarines and forced to descend to the water. The occupants, two officers, were captured by one of our aeroplanes and then brought back with their machine to a torpedo-boat, which took them to Zeebrugge."

Berlin, July 27th.

"A French biplane was shot down in an aerial fight near Beine (east of Rheims)."

Berlin, July 28th.

"One of our naval airships on July 25th executed an attack on the main base of the Russian and the British submarines at Mariehamn, in the Aland Islands, successfully dropping on the harbour works there 700 kilogrammes (1,540 lb.) of explosive bombs.

"Despite a heavy bombardment from enemy guns, the airship returned to her shed undamaged."

Berlin, July 29th.

"An enemy aeroplane near Roclincourt, north of Arras, was shot down by a direct hit from an anti-aircraft gun.

"Our aviators (with Marshal von Hindenburg's armies) repeatedly attacked enemy troops, transport trains, and railway buildings with success.

"A Russian aeroplane was shot down in an air fight south of Perespa.

"On Thursday the Russian air station at Lebara-on-Zerel was again twice attacked by a squadron of our seaplanes, first early in the morning and also in the evening. In spite of a heavy fire from anti-aircraft guns, good results were obtained on the aviation station, on which hits and fires in the sheds were observed. One building belonging to the aviation station was burnt down.

"On July 26th, after an air fight over the Doiran Lake, an enemy aviator fell down."

Berlin, July 30th.

"Near La Chalade, in the Western Argonne, in an air fight Lieutenant Baldamus put his fifth enemy machine *hors de combat.*

"Two other enemy aeroplanes were brought down—one on the eastern border of the Argonne, and the second east of Sennheim (in Alsace)."

Berlin, July 31st.

"An enemy air raid on Conflans was replied to by a bombardment of Pont-à-Mousson.

"A French aeroplane squadron which was sent against Mülheim (in Baden) was stopped near Neuenburg by our Fokkers, put to flight, and pursued. The enemy leading aeroplane was brought down north-west of Mulhausen.

"Lieutenant Höhndorf put his eleventh enemy machine out of action north of Bapaume and Lieutenant Wintgens his twelfth east of Péronne. A French biplane was brought down west of Pont-à-Mousson and another south of Thiaumont—the latter by anti-aircraft guns.

Turkish. *Constantinople, July 28th.*

"One of our aviators on Monday flew over Tenedos and successfully dropped bombs on hostile ships and boats in the roadstead.

"On Monday the enemy, under the protection of guns, landed from some vessels over a hundred bandits north of Tuzla, west of Aivadjik. In an encounter between our troops and the bandits the latter lost some dead and wounded, and subsequently fled to their ships. Meantime, two of our aviators attacked the ships and boats by dropping bombs and firing machine-guns, inflicting losses on the enemy."

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R.A.F. Employee in Trouble.

AT Aldershot, on July 27th, Reginald Forester McDonnell was charged on remand under the Public Stores Act, 1875, with being in unlawful possession of certain Government equipment, instruments and parts of an aeroplane. Originally there were four separate charges, two under the Army Act (1881), Section 156, but three were withdrawn.

Mr. Pearce, who prosecuted for the War Office, said that at the outbreak of war the defendant was employed at the Royal Aircraft Factory, where for some time he had been a charge hand. The police had recently discovered that the defendant had at three places a large quantity of Government property connected with aeroplanes. The bulk of this was found in a shed at the back of the North Camp Hotel, Farnborough, some at the defendant's house, and some at a room he rented.

When arrested the defendant said: "Whatever you find belongs to me. It was given to me by the late Col. Fulton (chief of the Aeronautical Inspection Department) and Mr. Cockburn, one of the present A.I.D. inspectors, can vouch for it." Mr. Pearce read a letter from the defendant bearing no date, but received in April, 1915, asking Major Heckstall-Smith (Assistant Superintendent, R.A.F.), for the loan of an obsolete 35 h.p. Anzani engine for use in connection with a baby biplane of defendant's own design, then almost completed. In the letter refusing this there was a warning to the defendant that Government property must not be taken, nor could it be lent for experiment.

Major Heckstall-Smith identified several articles. He said that even when he knew from that letter that the defendant was building an aeroplane he did not suspect him.

Cross-examined by Mr. Brandon (for the defendant), the witness said that he had many employees who were building aeroplanes or working on aeroplanes of private design without using Government material. Asked if it was not a fact that McDonnell was arrested when he returned from a meeting of the R.F.C. Inquiry Committee, the witness said that he did not know that the defendant was at the Inquiry.

Re-examined by Mr. Pearce, the witness said that he had been told that the defendant did not in fact give evidence before the Commission.

The defendant, giving evidence on oath, said that by an agreement which he signed anything he designed became the property of the Government. Some of the material in court had been given to him, and some he had obtained permission to use. One propeller he bought from the late Mr. Cody's son. One or two things had been left in the shed by other employees. He had done nothing secretly. Most of the things he had taken had come from the scrap heap.

The Bench convicted and fined the defendant the maximum penalty of £5, refusing to discuss the question of honest or dishonest intention.

The "Triple Slide Aeroplane Calculator."

ONE of the above instruments, which was described fully in our issue of July 20th, has now arrived at the offices of "FLIGHT," where we shall be pleased to demonstrate it to prospective purchasers who might wish to see it working before finally deciding to acquire one of these highly ingenious and time-saving devices. We might add that we have tried it on the calculations of several known examples of machines, and that it appears to tally very well with actual figures.

◆ ◆ ◆ ◆

PUBLICATIONS RECEIVED.

Hints for Flight Sub-Lieutenants, Royal Naval Air Service. By Flight Lieutenant. London: Forster, Groom & Co., Ltd. Price 1s.

Arabic for Our Armies. By Frank Scudamore. London: Forster, Groom & Co., Ltd. Price 3*d.*

"Sprechen Sie deutsch" and "Parley Voo"! By Col. F. N. Maude, C.B. London: Forster, Groom & Co., Ltd. Price 4*d.*

Aerial Russia: the Romance of the Giant Aeroplane. By Lieutenant-Colonel Roustam Bek. London: John Lane. Price 2*s.* 6*d.* net.

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[Owing to extreme pressure on our columns "From Other Sources" and many features of "FLIGHT" are unavoidably crowded out.—ED.]

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

The Royal Aero Club.

WHEN a conscientious body of men have been working enthusiastically and unwearingly over a number of years for the sake of a cause dear to their hearts, probably no payment computed in mere £ *s. d.* could possibly repay them for all their disinterested thought and foresight in the same degree as a mark of high appreciation from those on whose behalf the consistent labours have largely been devoted. That this endorsement of their efforts on behalf of the Club directly and of the air conquest movement generally was so wholeheartedly forthcoming at the recent special general meeting of the Royal Aero Club, when it was decided to increase the subscription, with the object of extending the Club's usefulness, must have been a source of the greatest gratification to the Committee of the Club. This up-to-date policy of the Committee is, without doubt, the right note to strike at such an all-important period as the present in the development of the realm of the air, as the enormous influx into the ranks of practical aviation at the present time calls for the establishment of a meeting ground for those whose lives have been committed to whatever the future of Aviation may evolve for them collectively and each individually. Probably no other art, science, sport, occupation, or by whatever other name one designates the problem of aerial navigation, calls more for a common platform upon which can be presented, for mutual criticism and discussion, the thousand-and-one interesting and novel points which are arising from day to day, as the mysteries leading to the Dominion of the Air. For a long time there has been a growing and strongly expressed desire amongst all sections of those associated with Airism that such an aerial "Mecca" should be brought into being. This fact has, of course, been fully realised by those in control at the Royal Aero Club, but they have naturally had to consider ways and means, and carefully wait until the time was really ripe for "jumping off" on what might easily, in such times as the present, result in disaster. By waiting thus long as the Committee have done, they have exercised the wisest possible judgment, and they have every prospect now of reaping the rich harvest of success, on behalf of the Club as a body, which their judicious and unimpeachable methods in the past have earned for them. In the earlier days of the war we ventured to enter the ranks of the prophets by foretelling this very period of increased activity and scope for expansion, as to us it was manifestly evident that the rapidly extending list of Service pilots must sooner or later bring into being a club, in every sense of the word, where they could be sure of finding congenial company, to whom the mysterious jargon of the craft and the exchange of thought were as the breath of life. No longer need there be any worry upon this point, as by the resolution at the general meeting of the members of the Royal Aero Club the breach has been filled, and probably by the end of the year, if not before—it may be by October next—the Club will be installed in a roomy and convenient House, where members will have at their disposal all the more substantial benefits of a social club, whilst having the much-honoured privilege of belonging to a body which has a history behind it as an epoch-making Society of Encouragement, and which is, moreover, in possession of the guiding and controlling reins of the official side of the art and sport.

The result of the meeting was a foregone conclusion, as it will be remembered that when, some time back, the Committee issued a form of inquiry for ascertaining the views of the individual members, a very large majority resulted in favour of extending the operations of the Club by acquiring suitable House premises, more in keeping with the important position which the Club holds in the country. Since then the Club has steadily waxed stronger, until it has greatly outgrown its present habitation. That there should be no iota of a mistake, the Committee, in calling the formal meeting to decide the question, again sent out to every member a fresh form of inquiry, so that recently-elected members might have a voice in the matter, and in which special attention was drawn to the opportunity for re-expressing their views, in the case of older members in the event of their having modified their opinion in the interim. The response—or rather comparative absence of response—to this opportunity was about the greatest compliment to their proposals the Committee could have had. The result, expressed in figures in last week's issue of "FILGHT" under the Club's official notices, speaks for itself. So few proportionally were the objectors that the voting by the means of these forms may be regarded as unanimous, especially as most of the very, very few who were at variance with the wishes of the majority, were only so at variance upon some minor point, and qualified even at that. The position, therefore, now stands that as from January, 1917, members will be called upon to pay the moderate subscription of £5 5*s.* per annum, and will receive in exchange all the benefits which a well-appointed social club can provide, as the Committee have already well in hand the negotiations for suitable premises, which, by the time these lines are in print, may even have been concluded.

For a long time past members of both Services have been conspicuous in their numbers in joining up with the Club, and now that the important decision has been taken to go forward with the enlarged scheme, we can see the prospect of a greatly increased membership eventuating between now and the end of the present year. It would be as well for prospective members to have it well in mind to put their names down on the list, as, should the applications accrue in anything like the ratio that we anticipate, there will be the prospect of late-comers having to face an increased entrance fee somewhat more onerous than the modest two guineas which, for the present, still holds good.

We offer our sincere congratulations to the Club Committee upon the success of their administration of the Club's affairs, and the highly promising prospects of the Club in the future give every sign of adding still more to the monument of progress which the Club's past work has set up. It is a work which those who had a part in its building must regard with considerable pride, and in this connection we cannot close without a reference to the untiring and enthusiastic work which in the history of the Club will ever be associated with the name of its Secretary, Lieut.-Commander Harold G. Perrin, R.N.A.S., who from soon after the outbreak of hostilities has been also, with indefatigable ability, serving his King in another direction. To Mr. B. Stevenson, the Assistant Secretary, who in Lieut.-Commander Perrin's temporary absence has been entrusted with the main working of the Club, ably seconded by the Staff, is also due a large measure of thanks for the tactful handling of the Club's affairs during the very trying period of war through which the Committee have had to steer the Club's responsibilities placed in their care.

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Another V.C. for the R.F.C.

In a special supplement to the *London Gazette* issued on Saturday it was announced that His Majesty the King had been graciously pleased to award the Victoria Cross to the undermentioned officer for most conspicuous bravery and devotion to duty:—

Captain (temporary Major) LIONEL WILMOT BRABAZON REES, R.A. and R.F.C.

For conspicuous gallantry and devotion to duty. Whilst on flying duties Major Rees sighted what he thought to be a bombing party of our own machines returning home. He went up to escort them, but on getting nearer discovered they were a party of enemy machines, about ten in all. Major Rees was immediately attacked by one of the machines, and after a short encounter it disappeared behind the enemy lines, damaged. Five others then attacked him at long range, but these he dispersed on coming to close quarters, after seriously damaging two of the machines. Seeing two others going westwards, he gave chase to them, but on coming nearer he was wounded in the thigh, causing him to lose temporary control of his machine. He soon righted it, and immediately closed with the enemy, firing at a close-contact range of only a few yards, until all his ammunition was used up. He then returned home, landing his machine safely in our lines.

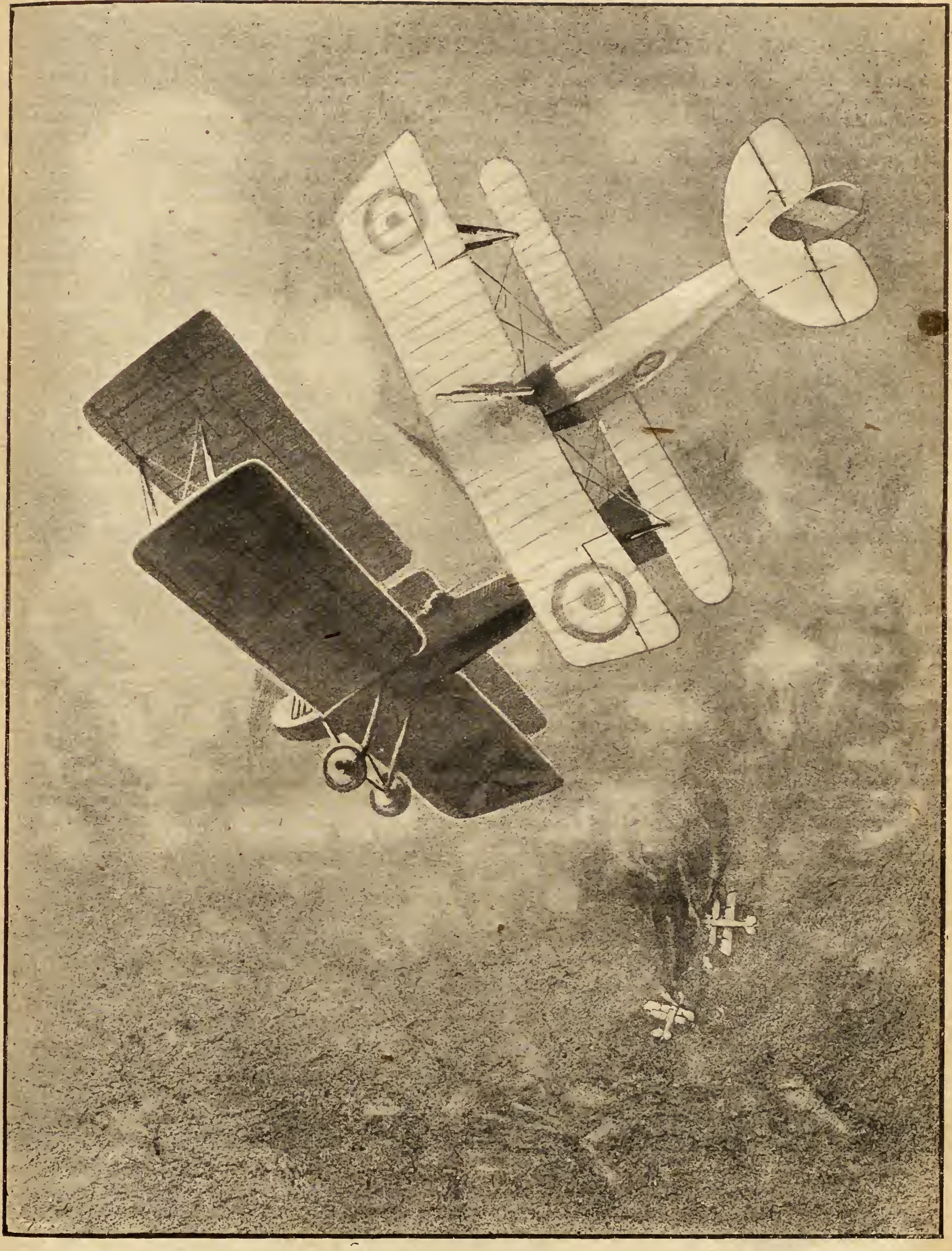
British Raid on Aerodrome near Ghent.

THE Secretary of the Admiralty made the following announcement on the evening of August 4th:—

"On August 2nd successful attacks by a naval aeroplane squadron of bombing and fighting machines were carried out on the enemy's aerodrome at St. Dennis Westrem and on his ammunition sheds at Mierelbeke.

"About 2 tons of bombs were dropped on the objectives and considerable damage was done.

"One of our fighter machines (Flight Lieut. Baudry, R.N.) is missing, and is believed to have been shot down. The remainder returned undamaged."



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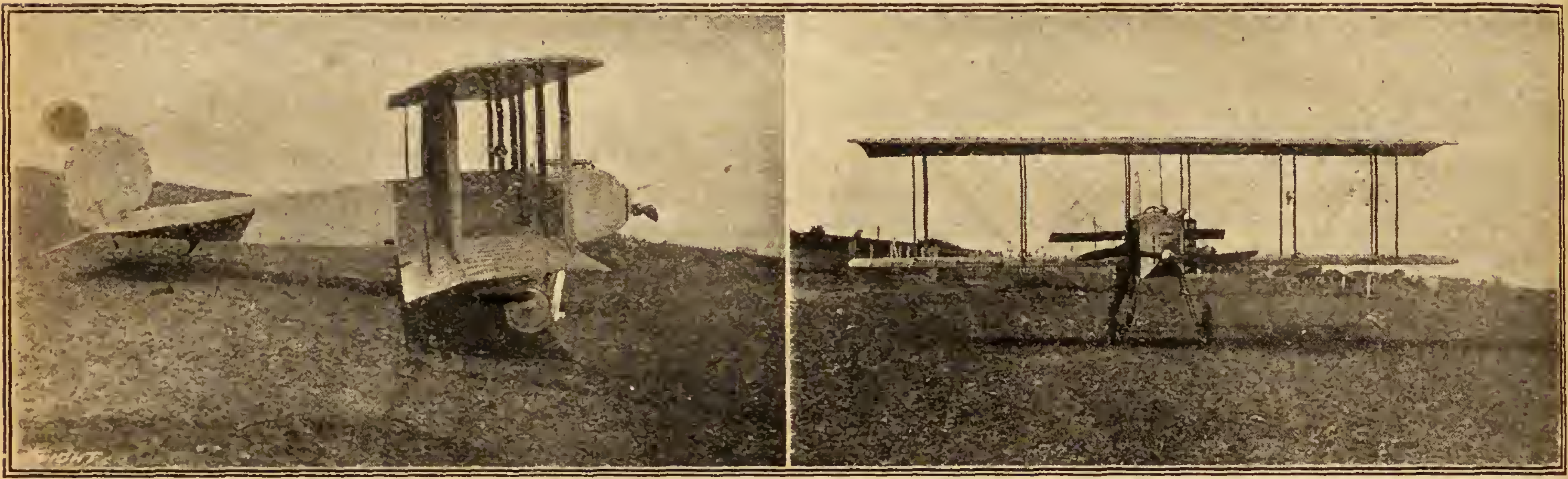
QR.-MASTER TERLINE'S HEROIC SACRIFICE.—The incident in which this French air pilot, in a heroic air fight (accepting the version of those who vouch for the incident, in conjunction with the expressed resolve of Qr.-Master Terline, to, if necessary, ram the enemy in mid-air), deliberately rammed the German aeroplane, although realising the action meant certain death to himself. A tribute paid to this hero of the air by one of his brother pilots who was engaged in the same air fight, and which we reproduce on page 684, from the *Daily Telegraph's* Paris correspondent, records one of the most remarkable deeds of the war.

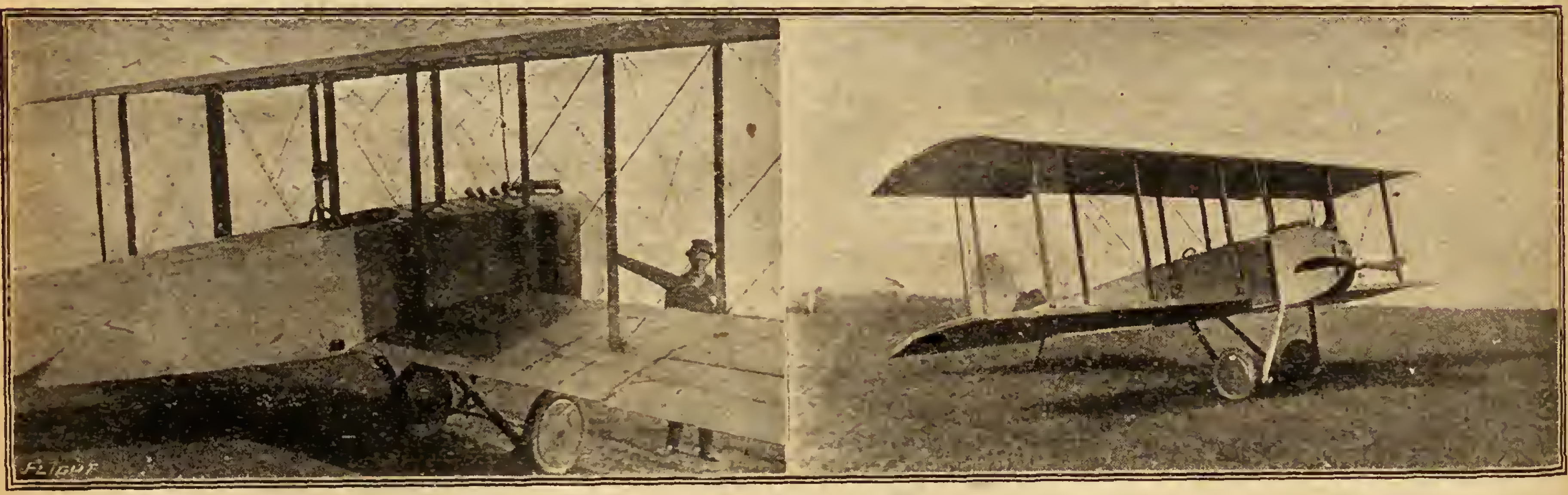
THE NEW WRIGHT TRACTOR BIPLANE—TYPE L.

In general appearance the new Wright tractor does not present anything startling, but follows fairly closely along standard lines. It is designed to combine a fair speed range with reasonable power and low purchase price and cost of upkeep. Its lines do not impress one as being particularly pleasing, and it would appear to have been quite possible to have improved these considerably without necessarily increasing the cost. However, according to reports the machine flies very well, and after all that is the main consideration.



THE LATEST WRIGHT MILITARY SCOUT.—Views from the side and in front.

The main planes are of a totally different section from that of the older Wrights, but no dimensions of the new wing section are available. The top wing is built up in three sections, and the lower in two, the end sections being interchangeable. Bracing is effected by solid wires, all the lift wires being in duplicate. No turnbuckles are employed, the ends of the wires being formed with eyes, securely soldered, which loop over hook plates under the ends of the struts. Instead of having the body struts run to the top rails of the body, as is standard practice on this side, they are connected at the top to a centre section, and at the bottom to a short length of wing secured to the sides of the body. In this way the outer sections of the wings are easily detachable for purposes of transport. The inter-plane struts are of spruce, streamlined, and fit into sockets with their ends. By taking out a small bolt which runs through the strut and its fitting the struts are slipped out, releasing the wires from the hook-plates. The main wing spars are of spruce, as are also the ribs, which are of I section.

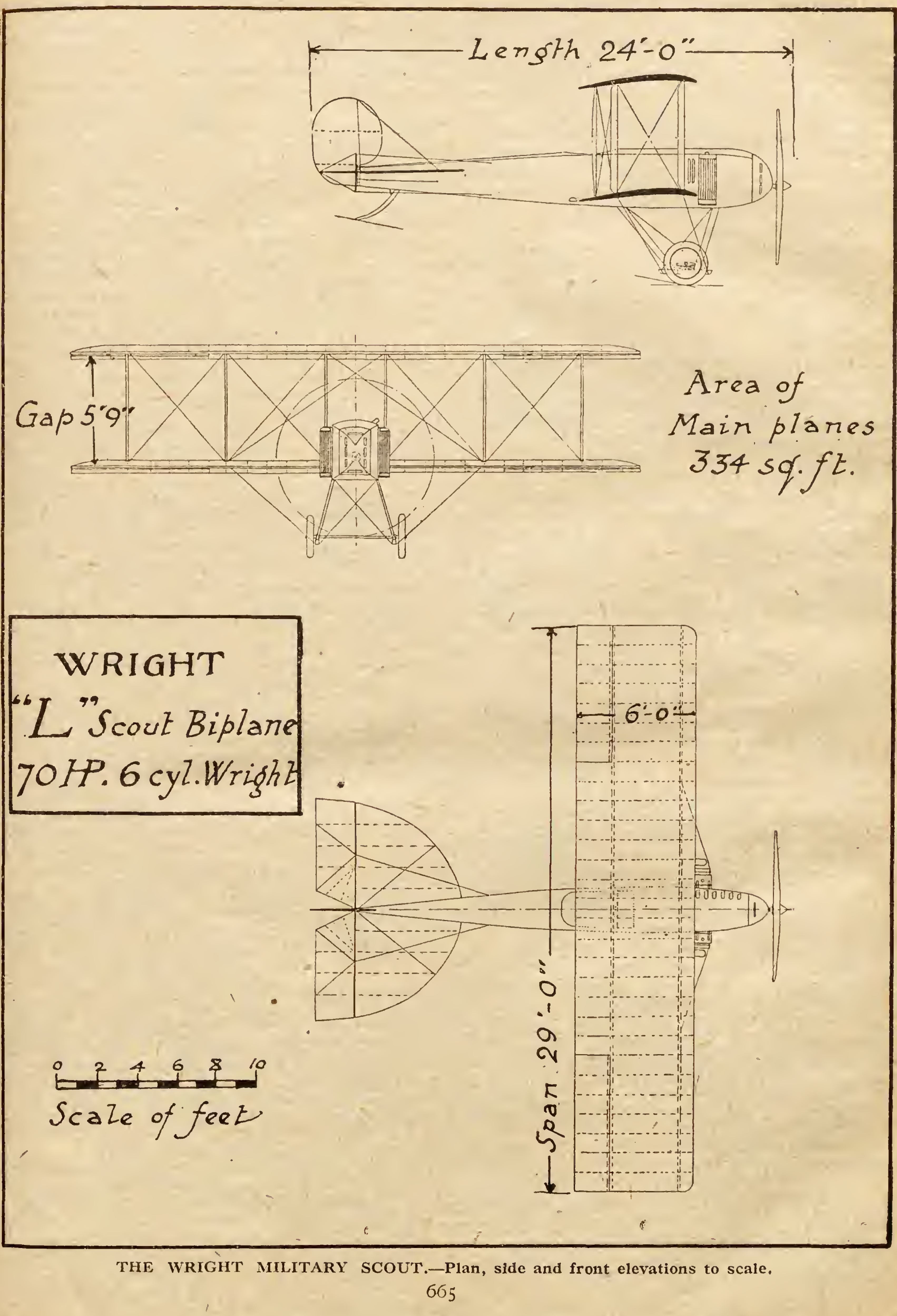


THE LATEST WRIGHT MILITARY SCOUT.—Three-quarter rear and front views respectively.

The tail consists of a semi-circular fixed stabiliser, non-lifting, to which the elevator flaps are hinged.

Lateral equilibrium is maintained by double-acting ailerons cut out of both upper and lower planes, hinged to the rear spars. These have a slight curve, and normally are actual portions of the wings. A spruce spacer strut connects the upper and lower ailerons. The control cables run from the spacer strut-ends over pulleys at the upper and lower extremities of the adjacent plane struts and along the wings to the steering column. The cable from the lower aileron runs to the top of the strut and *vice versa*. The ample surface of the ailerons insures very easy control. The balanced rudder is operated by cables running into and through the fuselage to the "grip" or lever on the steering wheel. The elevator flaps are operated by cables from the masts through the fuselage to the wheel.

The steering set used is the standard Wright system, in which, it will be remembered, that turning



THE WRIGHT MILITARY SCOUT.—Plan, side and front elevations to scale.

the wheel right or left operates the ailerons ; rocking the wheel and its supporting column fore and aft operates the elevators. An aluminium hand lever turns the rudder with very little pressure. Gripping the wheel and the lever at the same time in one hand causes the rudder to turn simultaneously with the operation of the ailerons, otherwise the ailerons may be operated entirely independently. The aileron and rudder cables end in short chains which run over sprockets on the steering column. The aileron sprocket is rigidly attached to the axis of the steering wheel. The rudder sprocket is free on the same shaft. Gripping the rudder lever with the wheel in one hand obviously rotates the two sprockets simultaneously.

The fuselage is of usual box girder construction, strongly braced. The nose is covered with aluminium, with very large doors to give access to the motor. The remainder is covered with linen, doped, painted grey and varnished. The deck is of veneer, linen covered. The body tapers to a vertical knife edge at the rear. The rudder is hinged to the rearmost strut of the fuselage. Where control cables pass into the fuselage brass eyelets are used. In the fuselage no bolts pass through the rails, a special fitting obviating this practice. The longitudinal rails are ash, and the struts are spruce. The pilot sits in a comfortable seat under the trailing edge of the upper wing.

In front of him is a dash with petrol gauge, clock, aneroid, pressure gauge and speed indicator mounted thereon. Pressure in the tank is maintained by hand pump. The engine may be primed from the seat. The right foot operates the throttle pedal, and the left pedal takes care of the magneto advance. Between the two is a magneto cut-out button.

On a strut is fastened the Wright Incidence Indicator which gives at all times the angle of the chord of the planes with respect to the air currents through which the machine is flying, and is entirely independent of gravity.

The motor is the latest Wright, six cylinders, 4⅜ ins. by 4⅝ ins. bore and stroke, rated at 70 h.p. The tractor screw, of high pitch, is mounted on a short shaft, which forms part of the Wright flexible drive. The engine shaft has a light flywheel keyed to it. Concentric with this is a steel disc, to which the propeller shaft is keyed. Eight stud bolts project from the disc and the flywheel respectively, and over each pair of studs is a short but very heavy endless rubber band. These bands transmit the full power of the motor to the propeller, and absorb vibration and sudden strains on propeller or engine shaft. The petrol tank is to the rear of the motor, enclosed in the fuselage. The entire engine is covered in by the fuselage, the exhaust pipes sticking through holes in the deck. A flat tube radiator is on either side of the nose of the fuselage, and these are quickly demountable by unfastening retaining straps which hold them to plates attached to the framing. The hose connections can be quickly taken off.

The chassis is very simple. The axle is a steel tube, and the weight of the machine is taken by rubber band shock absorbers. The wire wheels are fitted with aluminium discs ; the chassis struts are of ash.

Span is 29 ft. ; gap, 5 ft. 9 ins. ; chord, 6 ft. ; area main planes, 334 sq. ft. ; length over all, 24 ft. ; weight empty, 850 lbs. A useful load of 650 lbs. may be carried, including 12 gallons of fuel for 2 hours' flying, water, oil, pilot, &c. The gross weight per square foot, including ailerons, is 4·5 lbs.

◆ ◆ ◆ ◆

The Roll of Honour.

THE Secretary of the Admiralty announces the following casualties :—

Missing (AUGUST 2ND).

Flight-Lieut. R. G. A. Baudry, R.N.

Accidentally Injured (AUGUST 4TH).

Flight-Lieut. C. R. Blagrove, R.N.

Slightly Wounded.

Flight-Lieut. J. E. B. MacLean, R.N.

Seriously Injured (JULY 29TH).

Flight-Sub-Lieut. H. G. Ford, R.N.

Slightly Injured (JULY 30TH).

Flight-Sub-Lieut. A. V. Bowater, R.N.

Previously reported Missing, on January 6th, 1916, now presumed Killed.

Flight-Commander H. A. Busk, R.N.

The following casualties have been officially announced by the War Office :—

Killed.

Second Lieut. G. V. Randall, E. Lancs. R. and R.F.C.
Lieut. D. B. Richardson, R.E. and R.F.C.
Lieut. D. Wilson, Royal Flying Corps.

Died of Wounds.

Second Lieut. J. L. Reid, Northumberland F., attd. R.F.C.

Accidentally Killed.

9468 1st Class Air-Mechanic D. Carey, R.F.C.

Wounded.

Second Lieut. G. M. Angier, R. Sussex R., attd. R.F.C.
Second Lieut. R. J. Bennett, Royal Flying Corps.
Second Lieut. W. E. G. Bryant, R. Fus., attd. R.F.C.
Capt. J. Callaghan, Royal Flying Corps.
Second Lieut. H. J. W. Collins, Gloucester R. and R.F.C.
Lieut. L. T. N. Gould, R.G.A., attd. R.F.C.
Second Lieut. A. Hughes, Royal Flying Corps.
Lieut. H. H. James, Manchester R., attd. R.F.C.
Second Lieut. J. W. Jardine, Royal Flying Corps.
Lieut. G. K. C. Kerr, Shropshire L.I., attd. R.F.C.
Second Lieut. E. L. Lewis, Essex R., attd. R.F.C.
Second Lieut. J. F. Morris, Royal Flying Corps.
Second Lieut. G. S. D. M. Pape, Royal Flying Corps.
Lieut. R. H. C. Usher, Wilts R., attd. R.F.C.
Lieut. H. H. Watkins, R.F.A., attd. R.F.C.
Second Lieut. T. J. West, E. Yorks. R. and R.F.C.
Lieut. L. E. Whitehead, Royal Flying Corps.
Second Lieut. R. P. Willcock, Oxford and Bucks L.I. and R.F.C.
7258 1st Class Air-Mechanic H. Brown, R.F.C.

Missing.

Second Lieut. F. Bowyer, Royal Flying Corps.
Second Lieut. J. A. Brown, Royal Flying Corps.
Capt. L. S. Charles, Worcester R., attd. R.F.C.
Lieut. E. R. Farmer, Yeomanry, attd. R.F.C.
Second Lieut. L. N. Graham, W. Yorks. R., attd. R.F.C.
Second Lieut. J. G. Robertson, Royal Flying Corps.
Second Lieut. E. D. Steytler, S. Lancs. R. and R.F.C.
Lieut. C. Williams, Highland L.I., attd. R.F.C.

Previously reported Missing, now reported Prisoner of War.

Lieut. W. B. Ellis, A.S.C., attd. R.F.C.

Previously officially reported Missing, now unofficially reported Prisoner of War.

Second Lieut. C. Kerr, Royal Flying Corps.

Corrections : **Missing.**

Capt. W. D. S. Sunday, R.F.C., should read :

Wounded.

Capt. W. D. S. Sanday, Royal Flying Corps.

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared among the Admiralty announcements of August 5th:—

Flight Commander T. K. Elmsley promoted to the rank of Squadron Commander, with seniority June 30th.

Temporary Sub-Lieutenant, R.N.V.R., E. F. Turner promoted to Temporary Lieutenant, R.N.V.R., with seniority August 2nd.

The following appeared among the Admiralty announcements of August 7th:—

The undermentioned have been entered as Probationary Flight Sub-Lieutenants, with seniority as stated: F. E. Banbury, June 28th; H. E. Gonyon, June 30th; E. D. Roach, July 5th; A. W. Farquhar, July 7th; B. Devlin, July 8th; G. R. D. Wooler, August 5th.

Probationary Flight Sub-Lieut. A. E. E. Blackburn and Sapper R. St. H. Clarke granted temporary commissions as Sub-Lieutenants, R.N.V.R., both with seniority August 5th.

Royal Flying Corps (M.W.)

The following appeared in the *London Gazette* of August 1st:—

Memorandum.—Temporary Second Lieutenants: Sergt. C. C. Marsden, from St. Paul's School, O.T.C., for duty with the Royal Flying Corps; July 29th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 2nd:—

Park Commander.—Qr.-Mr. and Hon. Lieut. (Temporary Capt.) J. Mead, R.F.C., from an Equipment Officer, and to be Temporary Major whilst so employed; July 19th, 1916.

Flight-Commanders.—From Flying Officers, and to be Temporary Captains whilst so employed: Second Lieut. V. D. Bell, Special Reserve; July 14th, 1916. Temporary Lieut. E. D. Johnson, General List; July 15th, 1916. July 16th, 1916: Temporary Lieut. G. N. Teale, General List (since killed in action); Temporary Lieut. C. F. Portal, R.E., Special Reserve. Lieut. A. R. S. Clarke, Dorset R.; July 18th, 1916. Lieut. J. S. Scott, Canadian Local Forces; July 20th, 1916. Temporary Lieut. E. L. Foot, General List; July 23rd, 1916.

Memoranda.—Temporary Lieut. Franks L. Robinson, from R. Mar. A., to be Temporary Lieut. on the General List for duty with the Royal Flying Corps; June 8th, 1916. Lieut. R. D. Bradshaw, 3rd Canadian Dns., to be Temporary Second Lieutenant for duty with Royal Flying Corps; June 5th, 1916.

The under-mentioned, from R.F.C., to be Temporary Second Lieutenants, for duty with the Military Wing of that Corps: Sergt. George E. Phillips; July 5th, 1916. Flight-Sergt. W. S. Hammond; July 6th, 1916. Corpl. F. W. Ham; July 15th, 1916.

Pte. H. A. B. Norris, from Lond. R. (T.F.), to be Temporary Second Lieutenant for duty with R.F.C.; July 22nd, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: S. Dendrino, J. Bell, R. F. Talbot, J. N. Holtom, C. W. Carleton, K. W. P. Hindley.

To be Second Lieutenants (on probation): F. C. Mears; July 10th, 1916. A. J. L. Chrystall; July 14th, 1916. July 25th, 1916: F. H. Holdsworth, B. Gaskin, P. S. Whitmore, J. A. Myburgh, C. E. de Berigny.

The following appeared in a supplement to the *London Gazette* issued on August 3rd:—

Flying Officers.—Second Lieut. F. J. Morse, K. R. Rif. C., Special Reserve, and to be seconded; June 22nd, 1916. Temporary Second Lieut. L. E. Owen, General List; July 3rd, 1916. Second Lieut. S. Dendrino, Special Reserve; July 5th, 1916. July 7th, 1916: Second Lieut. E. L. Benbow, R.A., from a Flying Officer (Observer). Temporary Second Lieut. H. J. W. Collins, Glouc. R., and to be transferred to the General List. Second Lieut. J. N. Holton, Special Reserve. July 13th, 1916: Temporary Second Lieut. F. McIntosh, K. R. Rif. C., and to be transferred to the General List. Second Lieut. J. D. Canning, N. Staff. R., Special Reserve, and to be seconded. Second Lieut. H. Jameson, Special Reserve, from an Assistant Equipment Officer. Second Lieut. F. S. Schell, Special Reserve. Second Lieut. J. Bell, Special Reserve. July 14th, 1916: Second Lieut. J. K. Stead, York R. (T.F). Temporary Second Lieut. F. L. Barnard, R. Berks R., and to be transferred to the General List. Second Lieut. A. O. K. Wright, Special Reserve. July 15th, 1916: Temporary Capt. R. K. Thomson, A.S.C., and to be transferred to the General List. Temporary Lieut. A. T. Easom, Notts and Derby R., and to be transferred to the General List. Temporary Lieut. W. G. S. Curphey, R. Berks. R., and to be transferred to the General List. Temporary Second Lieut. M. V. McKeon, R.A., and to be transferred to the General List. Lieut. S. C. H. Begbie, E. Surr. R., Special Reserve, and to be seconded. Second Lieut. (on probation) W. H. A. Heald, R. Fus., Special Reserve, and to be seconded. Second Lieut. R. FitzR. Talbot, Special Reserve; July 16th, 1916.

Memoranda.—Siddartha J. Oliver, from University of London O.T.C., to be Temporary Second Lieutenant for duty with R.F.C.; July 21st, 1916.

N.C.Os. and men to be Temporary Second Lieutenants (on probation) for duty with R.F.C. (Substituted for the notification in the *Gazette* of July 3rd, 1916): Pte. J. Clinkskill, from A.S.C.; May 28th, 1916. May 29th, 1916: L.-Corpl. E. J. Phelps, from R. War. R., Pte. F. J. W. Humphreys, from Sea. Highrs., (T.F.), Corpl. G. C. Twining, from A.S.C.; May 30th, 1916. Pte. J. S. Williams, from Canadian A.S.C.; May 31st, 1916. Sergt. J. M. R. Langley, from 19th Alberta Dns.; June 2nd, 1916. Sergt. Lewis C. Chapman, from R.E. (T.F.); June 3rd, 1916. Sergt. H. V. Jerrard, from R.F.C.; June 4th, 1916. Pte. Francis E. Glass, from A.S.C.; June 11th 1916. June 12th, 1916: Flight-Sergt. W. B. Everton, from R.F.C.; Flight-Sergt. A. S. Morris, from R.F.C.; 2nd Class Air-Mechanic C. J. Sandys-Thomas, from R.F.C.; 1st Class Air-Mechanic H. E. Hervey, from R.F.C.; June 14th, 1916.

Supplementary to Regular Corps.—Second Lieut. A. Lang relinquishes his commission; May 30th, 1916.

Second Lieutenants (on probation) confirmed in their rank: C. Holland, H. Hulbert, F. E. Sargood, C. E. Finlay, R. P. Atwood, J. T. Hanning, N. Comper, W. F. Williamson, P. Thompson. M. V. Barton to be Second Lieutenant; July 7th, 1916. To be Second Lieutenants (on probation): G. P. L. Jacques; July 3rd, 1916. A. L. Cockburn; July 7th, 1916. July 10th, 1916: H. R. Gillespie, N. L. Godber, P. Maggs, C. Woodall, R. H. Tweedy, F. I. Fleming, R. N. Corah, G. L. Bennet, P. M. E. Impey, G. E. Upton, R. J. Copley, E. A. Mayner; July 17th, 1916. C. R. Sloan July 22nd, 1916. C. D. Allan; July 29th, 1916.

The following appeared in the *London Gazette* of August 5th:—

Equipment Officer.—Lieut. C. Barber, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed; July 17th, 1916.

Flying Officer.—Temporary Second Lieut. J. F. Morris, General List; July 12th, 1916.

Flying Officers (Observers).—Temporary Second Lieut. A. D. Finney, R.A., and to be transferred to the General List; October 22nd, 1915. October 25th, 1915: Temporary Second Lieut. C. A. Bourne, R.A., and to be transferred to the General List; Second Lieut. J. M. Burd, R.A., and to be seconded. Temporary Lieut. F. L. Robinson, General List. June 8th, 1916. July 1st, 1916: Lieut. H. H. James, Manch. R., and to be seconded. And to be transferred to the General List: Temporary Second Lieut. T. J. West, E. York. R.; Temporary Second Lieut. J. Wedgwood, Suff. R.; Temporary Second Lieut. G. McDiarmid, R. Sc. Fus.; Temporary Second Lieut. E. L. Roberts, E. York. R.; Temporary Second Lieut. W. Birch, Norf. R. July 6th, 1916: Second Lieut. E. W. C. G. De V., Viscount Glentworth, War. Yeo. (T.F.); Temporary Second Lieut. H. I. Hanmer, S. Staff. R., and to be transferred to the General List.

Balloon Officer.—Capt. R. W. Bruce, Canadian General List; July 18th, 1916.

Memoranda.—The under-mentioned to be Temporary Second Lieutenants for duty with R.F.C.: Pte. B. W. Morriss, from A.S.C., M.T.; July 10th, 1916. August 5th 1916: Gnr. O. Longley, from H.A.C. (T.F.); Brian B. Lemon, from H.A.C. (T.F.).

Supplementary to Regular Corps.—The under-mentioned Second Lieutenants to be Lieutenants: June 1st, 1916: (Temporary Capt.) H. I. F. Yates, (Temporary Capt.) E. H. Colman, C. E. Wardle, J. A. W. Bourne, (Temporary Capt.) C. P. Grenfell, J. G. McEwan, G. B. Bulman, D. B. Sanders; June 13th, 1916. July 1st, 1916: E. A. E. Wood, J. D. Latta, (Temporary Capt.) E. B. Broughton, Temporary Capt. W. T. L. Allcock, (Temporary Capt.) W. G. B. Williams, E. W. J. Payne, A. P. Thurston. Second Lieut. R. True relinquishes his commission on account of ill-health; August 5th, 1916. The under-mentioned Second Lieutenants (on probation) are confirmed in their rank: R. T. Colley, H. Hamer, D. D. Fowler, W. L. Grech, K. L. Caldwell, G. G. Callender, R. Watts, C. R. Young, J. L. Luntley, H. A. Rigby, H. Weakley, E. F. B. Curtiss. The under-mentioned to be Second Lieutenants (on probation): Reignald M. Charley; June 14th, 1916. F. Ashworth; July 7th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 5th:—

Flight-Commanders.—From Flying Officers, and to be Temporary Captains whilst so employed. July 20th, 1916: Second Lieut. J. T. Whitaker, A.S.C.; Second Lieut. M. Le Blanc-Smith, Special Reserve. Capt. D. J. Sheridan, R. Ir. Fus., from a Flying Officer; July 23rd, 1916.

Flying Officers.—Second Lieut. R. Watts, Special Reserve; July 13th, 1916. July 17th, 1916: Temporary Second Lieut. F. T. Bridger, K.O. Scot. Bord., and to be transferred to the General List; Second Lieut. H. Hamer, Special Reserve; Second Lieut. K. L. Caldwell, Special Reserve; Second Lieut. G. G. Callender, Special Reserve. July 18th, 1916: Temporary Second Lieut. (on probation) J. L. Bamford, R. Sc. Fus., and to be transferred to the General List; Second Lieut. R. T. Colley, Special Reserve; Second Lieut. D. D. Fowler, Special Reserve; Temporary Second Lieut. E. S. Williams, General List; Temporary Second Lieut. G. Ross-Soden, General List. July 19th, 1916: Temporary Lieut. R. H. Hood, R. Scots, and to be transferred to the General List; Temporary Second Lieut. E. Burton, R.E., Special Reserve; Second Lieut. W. L. Grech, Special Reserve.

Assistant Equipment Officer.—Second Lieut. M. V. Barton, Special Reserve; July 10th, 1916.

Memoranda.—The under-mentioned to be Temporary Second Lieutenants:—July 29th, 1916: Corpl. H. B. Dell, from R.F.C., for duty with the Military Wing of that Corps; Trumpeter C. W. Langlands, from H.A.C. (T.F.), for dut with R.F.C.

Supplementary to Regular Corps.—Second Lieut. (on prob tion) F. Ashworth is confirmed in his rank.

The following appeared in a supplement to the *Lond Gazette* issued on August 7th:—

Adjutants.—Qmr. and Hon. Lieut. S. J. Payne, R.F.C from an Assistant Equipment Officer; May 13th, 191 June 11th, 1916: Temporary Lieut. C. C. Treatt, N. La R.; Temporary 2nd Lieut. J. Rubic, 4th D.G.; Capt. J. W Cruikshank, Durh. L.I., Special Reserve, and to be seconded June 21st, 1916.

Assistant Equipment Officers.—2nd Lieutenants, Speci Reserve: P. Craven; July 8th, 1916. K. W. P. Hindley July 12th. 1916. July 15th, 1916: P. A. Albrecht, L. F Bennett, H. R. Brutey, E. S. Cohen, C. A. Cuthbert, H Darnell, E. McM. Howes, R. L. Hubball, O. Lindquist Temporary Second Lieut. L. Macdonald, General List; Second Lieut. W. A. Robson, Special Reserve. July 21st, 1916 Second Lieutenants, Special Reserve: S. A. Harding, E. F. B Curtiss, H. Weakley. Temporary Second Lieut. A. E. Biscoe General List; July 24th, 1916.

Supplementary to Regular Corps.—The undermentioned t be Second Lieutenants. July 7th, 1916: R. L. Hubball, P Craven, P. A. Albrecht. W. A. Robson; July 10th, 1916 The undermentioned to be Second Lieutenants (on proba tion): A. Young; July 7th, 1916. W. H. Trinder; July 8th 1916. A. Weatherhead Thomson; July 17th, 1916. L. L Carter; July 22nd, 1916. July 24th, 1916: F. H. Sanders W. F. C. Nason, C. S. O'Grady; July 25th, 1916. S. Willmett July 29th, 1916.

Central Flying School

THE following appeared in a supplement to the *London Gazette* issued on August 2nd:—

Instructors.—Capt. C. G. Bell, Special Reserve, a Flight Commander, vice Lieut. (Temporary Capt.) G. D. Hill, 7th Hrs.; July 11th, 1916. Lieut. (Temporary Capt.) J. P. C Cooper, Special Reserve, a Flight-Commander, vice Lieut (Temporary Capt.) E. O. Grenfell, R.A.; July 12th, 1916 Capt. (Temporary Major) F. G. Small, Conn. Rang., a Squadron Commander, vice Capt. (Temporary Major) G. D Mills, Notts and Derby R.; July 13th, 1916.

Instructor in Theory and Construction.—Capt. G. Adams S. Lan. R., an Equipment Officer, vice Capt. (Temporary Major) J. H. A. Landon, Essex R. (T.F.); July 11th, 1916.

Officer in Charge of Test Flight.—Capt. (Temporary Major G. D. Mills, Notts and Derby R., a Squadron Commander from an Instructor, vice Capt. (Temporary Major) J. E Tennant, S. Gds.; July 13th, 1916.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Club Premises.

Alteration of Rule 50.—At the Special General Meeting of the Members held on July 27th, 1916, it was unanimously resolved that Rule 50 be altered as follows:—

> "RULE 50.—For the year 1917 and thereafter the subscription for Members shall be £5 5*s.* 0*d.* per annum, and for Lady Members £2 2*s.* 0*d.* per annum, or such other sum as may be decided upon in General Meeting, and the entrance fee £2 2*s.* 0*d.*, or such other sum as the Committee may from time to time determine."

The arrangements for the Club House are not yet completed, but full particulars will be issued shortly.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to August 1st, 1916	10,806	1	8
Collected at the Westland Aircraft Works, Yeovil (Forty-third contribution)	0	19	2
Total, August 8th, 1916	10,807	0	10

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

FROM THE BRITISH FLYING GROUNDS

Grahame-White School, Hendon.

Straights with instructor last week: Messrs. Alty, Duncan, Edwards, Fisher, Lyles, Mills, Ormerod, Saunders, Soden, Shadwell, Styles and Ward. Circuits with instructor: Messrs. Ballard, Cockell, Drew, Jamie, Rodocanachi and Stevens. Eights with instructor: Messrs. Donald, Goodhart, Kay, Keymer, and Wellinkar. Eights alone: Mr. Cooper.

Instructors: Messrs. Manton, Winter, Pashley, Biard and Hale.

Beatty School, Hendon.

The following pupils were out during last week: Messrs. Cuthbert, Hathaway, Gadsden, Mitchell, Curry, Earl, Rudd, Skeet, McPherson, Garlick, Towson, Austen, Elliott, de Wilde, White, Wood, J. Squires, Sach, Wilkinson, Hick and Owen.

Some pilots who have recently taken their Royal Aero Club tickets at the Hall Flying School, Hendon.—(1) Mr. G. J. Halliday, (2) Mr. Eric Armitage, (3) Mr. F. Smith, (4) Mr. J. Collier, (5) Mr. G. S. Deane, (6) Mr. H. F. Skinner.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell, and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes.

Hall School, Hendon.

Pupils receiving instruction during last week:—With J. Laurence Hall: Messrs. Russell and Graham-Davies. With Cecil M. Hill: Messrs. Gudger, Worswick, Rayne, Le Grice; also Orton, Cordner, Davis, Russell, Cowney, Lieut. Malden, passenger flights in front seat with dual control. Mr. Rand was taking extra practice learning spirals, tail slides, vertical banks, &c. With Instructor Glegg: Messrs. Stamps, Course, Mayer, Lieut. Malden, Messrs. Yuill, Smith, Maude, and Lieut. Packman; Lieuts. Malden and Packman doing short hops, the others rolling practice.

The following pupils should soon qualify: Messrs. Le Grice, Cowney, Russell, Graham-Davies and Rayne.

Royal Aero Club Certificate taken by Mr. Worswick.

Hall Government type tractors in use.

London and Provincial School, Hendon.

Pupils doing straights last week: Messrs. Fox, Birkin, Dunnett, Randell, Rogers, Lewis, Mander and Quayle. Circuits and eights: Monsieur J. Leman.

Instructors: Messrs. W. T. Warren, M. G. Smiles and W. T. Warren, jun.

Royal Aero Club Certificates were taken by Messrs. A. E. Bush, W. Sivewright and O. Vickers. An excellent ticket, which should have been included in last week's report, was taken by Mr. D. L. Daly on July 22nd.

Ruffy-Baumann School, Hendon.

Pupils with instructors last week: Messrs. Holmes (1 h. 55 mins.), Carr (52 mins.), Babington Smith (20 mins.), West (1 h. 56 mins.), Barnes (50 mins.), Trubridge (44 mins.), Fanshawe (40 mins.) and Hayes (42 mins.). Pupils going alone: Messrs. Barnes and Holmes.

Tickets taken: Messrs. De Balme, Williams, Thomas, Westlake and Barnes.

Instructors: Messrs. E. Baumann, F. Ruffy, A. Baumann, and A. Thomson.

60 and 50 h.p. Ruffy-Baumann dual-control biplane machines in use.

Bournemouth School.

Pupils rolling alone last week: Messrs. Kennedy, Wingfield, Montgomery, Holland, Lieut. Lloyd-Owen, Messrs. Davies, Ross, and Wilmott. Doing straights alone: Messrs. Pritt, Brandon, Turner, Hammersley, Hinchliff, J. B. Smith, and Sergt.-Major Fenn. Half-circuits alone: Messrs. O. Wilson, J. Wilson, Little, H. Smith and Daniel. Figures of eights and circuits alone: Mr. J. L. Barlow.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

Two 35, one 45, and one 60 h.p. Caudrons in use.

Mr. J. L. Barlow took his ticket during the week on a 60 h.p. Caudron after completing his *brevet* tests. He rose to a height of close on 3,000 ft., and concluded with a v.p.

The spectators who visited the aerodrome during the week witnessed some fine flying by Mr. Summerfield, quite a lot of passengers being carried by the same pilot. During the week several Service machines again "called."

THE "X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 40" Raid, July 31st.

German Version.

Berlin, August 1st.

"During the night of July 31st–August 1st several naval airship squadrons successfully attacked London and the Eastern Counties of England. They dropped numerous bombs on the coast works, anti-aircraft batteries, and industrial establishments, which were important from a military point of view. In spite of heavy firing by the naval forces which began at our approach all our airships returned undamaged."

The following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief Home Forces:—

"X 41" Raid, August 3rd. 1.30 *a.m.*

"A number of airships crossed the coast in the eastern counties shortly after midnight this morning. Their objective has not yet been definitely ascertained, as the raid is still proceeding. Some bombs have been dropped in various places."

4.30 *a.m.*

"The raid appears to have been carried out by six or seven airships. A considerable number of bombs are reported to have been dropped at various places in the Eastern and South-Eastern Counties, but no definite reports have been received. No military damage has yet been reported. Many anti-aircraft guns were in action, and at least one airship is reported to have been hit." 4 *p.m.*

"Several hostile airships attacked the Eastern and South-Eastern Counties last night.

"The first reports of the raiders' arrival were received at about midnight. From these accounts it would seem that not less than six airships were attacking the counties of Norfolk, Suffolk and Essex more or less simultaneously. The raid lasted about one hour and a half. Except at one point, the raiders did not penetrate very far inland, but contented themselves with dropping a few bombs at a time on widely distant localities, mainly near the sea. Several bombs, in fact, are reported as having fallen into the sea.

"Anti-aircraft guns came into action at one locality, but the raider there attacked made good his retreat.

"In conjunction with this attack one airship was making for the coast of Kent. Many observers report that a second airship followed the first; the number of bombs dropped in this attack make the statement appear quite possible. The anti-aircraft guns came into action, and one, if not two, hits were claimed against the first raider.

"A total number of 80 bombs has been accounted for up to date, inclusive of those seen as falling into the sea.

"The total damage is astonishingly small; nine horses were killed and three others injured.

"The military object of the raid is not apparent."

German Version.

Berlin, August 3rd.

"Last night a great number of our airships again attacked the South-Eastern Counties of England, and dropped successfully a large number of explosive and incendiary bombs, especially on London, the naval base at Harwich, on railway works, and on industrial establishments in county Norfolk, important from the military point of view. On their approach the airships were attacked by enemy forces under rays of numerous searchlights, but they returned all undamaged."

The Press Bureau is officially informed that the above statement is practically untrue from beginning to end.

FLYING AT HENDON.

Looping displays and passenger flights predominated last Saturday's and Sunday's work at Hendon. On Saturday the weather conditions were very good, and there was in consequence quite a fair amount of flying. The atmosphere was extremely clear, and passengers had an excellent view from above of London and the surrounding country for miles. H. C. Biard, B. F. Hale, Marcus D. Manton, C. Pashley and J. S. B. Winter were kept very busy on the 80 h.p. Grahame-White three-seater biplane taking up passengers. W. T. Warren, Jun., made a fine flight on the new L. and P. tractor, during which he executed a loop. This promising young pilot handles this 'bus extremely well, making first-class landings. L. L. King made a flight on the all-Beatty-Wright, and further variety was given the proceedings by the unofficial flights on sundry B.E. 2c's, Curtiss tractors, &c. Eric Pashley paid his brother a flying visit on a de Havilland scout, upon which he put up some astonishing stunts.

On Sunday the afternoon opened with threats of thunderstorms, but cleared as the time passed. The wind, however, increased as the weather cleared, and flying was, therefore, somewhat retricted. The Grahame-White three-seater was, as usual, kept busy with passengers, and H. Sykes brought out the Martinsyde, but was prevented from doing much flying by a series of misfortunes. Both M. G. Smiles and W. T. Warren, Jun., took up passengers on the new L. and P. tractor, and looped on several occasions. On one of these flights Smiles, with a lady passenger, made 10 loops in succession from a height of 3,000 ft., to which altitude he took 10 mins. to climb without forcing. The last flight of the evening was one in which "young" Warren took the writer for a short flight on the L. and P.

The impression obtained during this flight was entirely favourable. Not only did the machine demonstrate that it is exceptionally steady when negotiating "bumpy" air, but it certainly possesses an appreciable amount of inherent stability. When descending, the pilot, taking his hands off the control, switched off, and the 'bus, immediately taking up its gliding angle, automatically "carried on."

ARMCHAIR REFLECTIONS

BY THE "DREAMER"

Many highly interesting theories have been put forward from time to time upon the strange conduct of dogs when there is an air raid in progress. Many letters have also been written in the same connection. Most of these have been ventilated through the columns of the press; other animals—cats, chickens, and even snails—being periodically brought within the scope of these theories.

The other day I read a letter in the *Daily Mail*, signed " C. V. D." This seeker after enlightenment claims that on several occasions during the past 12 months bombs have been dropped within anything from 50 to 100 miles of his house, and that his dogs always seem to know that an air raid is in progress, and indicate their knowledge by incessant barking. Nor are his dogs alone in this respect, for the adjacent farmers have the same to report about their own dogs, who are all alert, uneasy, and noisy.

He asks whether it is possible that dogs can hear at a greater distance than humans, and altogether appears to look upon the matter as uncanny.

There does not appear to me to be anythng uncanny in the matter. I think it is more that man is unversed, and supposes that all other animals must of necessity be built on the same plan as himself with regard to the senses.

One has only to reflect for a moment to realise that the contrary holds in nature. Man cannot, for instance, approach a dog's extreme sensibility with regard to the sense of smell—a bit of luck sometimes for the human! Just consider the way a dog will follow the track of another animal, hours or even days after that animal has passed that way, provided there has not been rain to destroy the scent.

Sight is a much more difficult thing to test in competition with man. But in dogs trained to the hunting of game, large and small, we have evidences of extremely quick, if not long, sightedness. A dog will notice the slightest movement out of the ordinary in long grass, or the like, caused by the passage of some small animal, when the same would entirely escape the notice of man, or would be thought to be merely movement caused by the breeze.

And so as to hearing. For it is, in my opinion, hearing, about which there is nothing uncanny, that the dog calls into play when he gives notice that something unusual is afoot during an air raid. Now, it does not necessarily follow that because all, or nearly all, animals have the sense of hearing, that they are all equally sensitive to the same sounds.

For instance, I am deaf, or nearly so, to all sounds above a certain pitch. I cannot hear the tick of a watch, even though close to my ear. Sometimes my attention will be called in the night to the hissing of rain outside—I cannot hear it. Yet I will undertake to pick up the distant sound of an aero engine in an approaching aeroplane, minutes before any of those standing around. As example, and also as showing my extraordinary long distance sight. On Saturday evening, leaving the Hendon aerodrome, I sighted an aeroplane up over the aerodrome at Chingford. The distance was, what? I do not know, perhaps 12 miles; it may be more. None of my friends could see it. I could not only see it, but I could *hear* it. Nothing extraordinary; simply that my ears, deaf to a high pitched sound, are extra sensitive to a low pitched one.

It is well known that a dog is sensitive to a sound of a high pitch. Why do we always whistle to call a dog to attention? It is because of his capability of hearing a highly pitched note.

I remember, long years ago, there were on sale in a shop in the Strand, some dog whistles which gave out no sound whatever. That is, it appeared to the human being that they gave out no sound. The fact is they gave a note so high in the scale of pitch that it was beyond the power of the human ear to distinguish any sound but the slight one given by the passage of the breath through the instrument. Yet a dog could hear it distinctly, even at a great distance. It may well be that a dog also hear lower sounds at a greater distance than humans. I am not a doggy man, and although I am very fond of them, have no great knowledge of their peculiarities,

It may be, therefore, that a dog can hear the sound of dropping bombs, or the hum of engines, at greater distances than we can. I am inclined to the belief, however, that what he hears is a note of a high pitch, possibly the passage of the propellers through the air, or the singing of wires, sounds altogether inaudible to us at any distance.

I am inclined to this belief because dogs do not, as a rule, take any great notice of the firing of guns. Dogs brought up to the sporting gun, take no notice whatever of its firing, unless it be discharged directly over its head, when it will cringe slightly. Even then, it is just possible that it is the singing of the pellets through the air that causes his momentary crouching, for I have noticed that a dog well out in the stubble, when partridge stalking is in progress, will crouch when shots pass above him, even when the gun which fired them is at a distance. I am, I say, not a doggy man, or I would try to learn something more about our four-footed friend than appears to be known. Why is it, I wonder, that a dog's eyes do not reflect? When I look into the eyes of a human I cannot penetrate beyond the surface. It is true they reflect. Eyes are honest in their reflections. I can read in them honesty, or its reverse purpose, love, kindness, fidelity, craftiness; but it is by reflection. When I look into the great, big, brown eyes of some dogs, I see beyond the eye, right down into depths unfathomable. I would love to study dogs had I the time. Meanwhile there are those students who can see nothing, and call purblindness in themselves, uncanniness in their canine friends.

AVIATION IN PARLIAMENT.

HOUSE OF LORDS.

The Royal Aircraft Factory.

In the House of Lords on August 1st, Lord Montagu had on the paper a notice to ask the Government whether they were prepared to circulate the recent Report on the Royal Aircraft Factory; what steps would be or had been taken to carry out its recommendations, and what alterations, if any, had been made in the higher staff at the factory. The noble lord, said that he had on Thursday week deferred this question, originally put down two months ago, and the case he had to put had been strengthened in the interval because there had been an effort on the part of those responsible for the Royal Aircraft Factory to put their house in order. The report, he thought, justified any remarks he had ever made about the Royal Aircraft Factory. The expenditure this year would probably be about a million sterling, which was a great deal for a factory which was theoretically doing experimental work. With regard to the figures of percentages, it was stated that Colonel O'Gorman had checked them, but he thought Colonel O'Gorman must unwittingly have misled the committee. He thought the number of men employed in the stores department—560—was an excessive number. With regard to the recommendation of the report that there should be skilled civil management of the factory, he thought that, if it was to continue in its present form, that was wise, but if it was going to continue only as an experimental depôt it did not matter. Passing to the report made by the Air Board to the War Committee, he congratulated the Air Board on the courageous way in which they had handled the matter; but he thought it would be a pity if Colonel O'Gorman's services to the State should be lost in an experimental sense, and he was glad to see the suggestion that he should be appointed as consulting engineer to the Director-General of Military Aeronautics at the War Office.

He cautioned the Air Board that, in his opinion, Sir David Henderson had far too much to do already. He was not only a member of the Army Council, and in command of the R.F.C., but he was also the responsible head of the Royal Aircraft Factory. The time had come when that distinguished officer should choose whether he preferred to remain a member of the Army Council or the officer commanding the Royal Flying Corps, or to have nominal control of the Aircraft Factory. It was quite impossible that he should continue in the three capacities; it would only lead to further trouble. It was quite clear that discipline had been slack and that there had been pilfering and excessive scrapping. Primarily, Colonel O'Gorman, as head of the factory, was responsible, but Sir David Henderson could not be exonerated, because he was the senior officer, and Colonel O'Gorman only did what he was told.

The other day he had made some statements before the Judicial Committee which had been shut out to a certain extent. One of the charges was that there had been unfair preparations in connection with the visit of the King to the Royal Aircraft Factory. He had evidence which had been sworn to, and which had been taken down in his presence. One man said that the day before the visit machines—old, new, and partially wrecked—were piled in the shops, and that vacant shops were furnished with spare parts to provide an appearance of congestion, and that a photograph of one shop was taken for the War Office to show the congested state of the premises. He had that kind of evidence *ad infinitum.* He had a letter from the wife of a late member of that House, who said a very valuable artisan of theirs had been three months at the factory and had not done a full day's work. He had evidence of unsuitable people being employed on different jobs. For instance, here is a lad of about 17, unskilled and rather delicate, who was put on at £2 2s. a week as overlooker, to walk round and see if there was any smoking, &c. There was also the case of the man MacDonald, who was charged at Aldershot with having unlawfully in his possession things belonging to the Aircraft Factory. The man made no secret of the fact that he was building at home an aeroplane of his own design; and according to his statement he was allowed to take away parts of the machine by persons in authority at the factory. Some of the parts were so large that it was impossible for them to be removed without the knowledge of those in charge. In fact, it was jocularly remarked that if he were strong enough he could have taken away a whole shed. It was quite clear that there was a want of supervision at the factory. When this man had got back, after giving evidence before the Committee of Inquiry in Westminster Hall, he was arrested. It might have been a coincidence, but it was a curious kind of coincidence, especially after they had had a pledge that witnesses should not be victimised. Another witness on returning to the Inquiry room to get some papers which he had left behind heard one officer say to another: "This is the adventurer who went up to give evidence against us," on which the other officer remarked: "Yes, you can never tell what sort of fellows you have in the factory these days." He thought those experiences pointed to an effort to browbeat and intimidate witnesses.

He was one of those who thought the Government never did anything so well as the private individual. The Government factory was more expensive and less efficient than the factory run by an individual or company. What was wanted was a large trade in the private manufacture of aeroplanes, well established and strongly financed. There was no doubt that the best machines were those designed outside the Government factory.

Earl Curzon said the first two points of the question on the paper were answered by the publication of the report upon the Royal Aircraft Factory, and the report thereon of the Air Board. As to the point in relation to changes in the higher staff of the factory, no one knew better than the noble lord that both business organisation and scientific knowledge were required in the running of so great a concern. Those two qualities were not necessarily found in the same person. It was for that reason that Colonel O'Gorman was taken to the War Office to attend to the scientific side by acting as consulting engineer to the Director-General of Military Aeronautics, and they were now searching for and hoped soon to find a first-rate business organiser for the factory. He did not think the noble lord was quite fair in what he said as to the present position of Sir David Henderson. The noble lord gave the House to understand that Sir David Henderson was a pluralist of an undesirable character, combining two or three functions which ought not to be found in the same individual. Nobody knew better than the noble lord that Sir David Henderson was placed upon the Army Council because he was the Military Director of Aeronautics, and nobody ought to be better pleased than the noble lord, who always urged the claims of the Air Service, that the head of the military branch of it should be able to enforce his views by means of his seat on the Army Council.

The Royal Aircraft Factory was a War Office institution. It was started some time before the war. Therefore the Air Board had nothing to do with it up to the moment that they came into existence. That fact dispensed him from saying much in reply to the speech of the noble lord in regard to it. But he was bound to say that, having read the evidence put before the Committee of Inquiry, he was astounded, nay, even scandalised, at the manner in which gossip, rumour, invention, and charges—very often wholly unsupported by evidence—were brought before the Committee. The noble lord himself gave evidence; and he did not mean to imply that that evidence deserved the adjectives which he had used; but he thought it was improper for the noble lord to come down to the House, after those charges were investigated by the Committee, and repeat them in detail and at length. The officials of the factory declared that those charges were untrue. They absolutely denied the story that there had been "window-dressing" on the occasion of the Royal visit. As to the witness MacDonald, he asked for one day's leave and was absent two and a-half days; during his absence he gave evidence before the inquiry, and on his return boasted that "me and Montagu have got them cold." He was found to be in the unlawful possession of things taken from the factory, though he denied it on oath, and was arrested. Since the war began less than 2 per cent. of the whole of the aeroplanes of the country had been made in the factory. Nevertheless, in spite of the views that are held—I think he thought rightly held—by the noble lord as to the undesirability of turning the factory into a considerable manufacturing centre, the Burbidge Committee recommended that the manufacture should be increased. No doubt that would be an excellent thing for the factory and from the point of view of the balance-sheet. But the reasons against it, which were really overwhelming, are in the first place that it is no part of the work of the factory to manufacture on a large scale. In the second place, he was convinced it would revive and increase the hostility of the trade. The view taken by the Government was that the main work of the factory must continue to be experimental rather than manufacturing. But in regard to the trade he declared that it was the desire of the Government to encourage private manufacture. At a meeting of the Air Board they had heard what the manufacturers had to say, and he had been rejoiced to hear how small was the area of complaint. Really what it came to was that they wanted more skilled labour to carry out a larger programme.

With regard to the smaller charges against the factory—such as that there had been idleness, an excessive number of workmen employed, that it was a refuge of shirkers—all he could say was that so far as he had been able personally to go into them he had found great difficulty in getting them substantiated. But if the noble lord liked to put the charges about which he was satisfied there was sound evidence in a way in which they could be investigated he promised that it should be done. But he prayed the noble lord not to come down to the House and use it for ventilating matters too petty for their lordships' attention and incapable of reply, because no one had the material to meet them.

In reply to the question as to what were the functions of the Royal Air Factory, he could define them as follows:—(1) Trial and experiment; (2) research; (3) preparation of drawings; (4) repairs; (5) the manufacture of "spares." He hoped he had shown that there was a very definite place in the military organisation of this country for the Royal Aircraft Factory, not only while the war was going on, but afterwards, and he believed that the factory, improved no doubt by the criticisms to which it had been subjected and the times through which it had gone, would take a definite and increasing part in the air defence of the future.

Lord Montagu proceeded to reply, when he was met with cries of "Order," and he resumed his seat. The subject then dropped.

Petrol in the Air Service.

In the House of Lords on August 3rd Lord Strachie inquired as to the principle upon which petrol had been allowed by the Petrol Control Committee. In the course of his speech he said he was informed, as regards aeroplanes, that even if they go out for a very short flight, when they come down the whole of the petrol is simply emptied on to the ground and wasted.

Lord Derby stated that Lord Strachie made an accusation, and he wanted to hold him to it. He said that in the Aeroplane Service when the men come back from a flight they empty the whole of their petrol tanks on to the ground. Can he give a single instance where that has occurred?

Lord Strachie: I have been so informed.

The Earl of Derby: Can the noble Lord give me the name of his informant and where it happened? I deny it absolutely.

Lord Strachie: I accept the noble Earl's denial at once, but he knows very well that I cannot give the name of my informant unless I have that person's permission.

The Earl of Derby: Nobody ought to make an accusation of this kind, which amounts to a charge of deliberate and disgraceful waste of Government material, without being prepared to give the reasons, the name, and the whole of the facts. If the noble Lord is not prepared to do that he should not have made the accusation. Of course, these petrol tanks have to be emptied; that is well known, and the reasons why are well known. But when the noble Lord goes on to state that when the aeroplanes come down the petrol tanks are invariably emptied on to the ground, I say there is not a word of truth in it, and I think he ought to withdraw such an accusation against the Aeroplane Service.

Lord Strachie: My Lords, in asking leave to withdraw my motion, I am bound to refer to the unprovoked attack which the noble Earl made upon me. Though I said at once that I accepted his assurance, he accused me with violence of language. I should have thought that the noble Earl would have been the last person to throw stones in that direction.

IN THE HOUSE OF COMMONS.

In the debate on the Consolidated Fund Bill in the House of Commons on August 1st, Mr. Pemberton Billing said: I apologise for intervening in an Irish debate by introducing another subject of national importance. In fact, I feel I cannot allow what happened at Question Time to-day to pass without some form of protest. I have received in this House many insulting replies to questions I have asked ——

Mr. Deputy-Speaker: Order, order! That is not a parliamentary word to be used in respect of answers given by Ministers or by a member's colleagues in this House.

Mr. Billing: Then may I say insolent reply. Is that possible?

Hon. Members: You will be suspended if you say that.

Mr. Deputy-Speaker: That is also an unparliamentary expression.

Mr. Billing: Then all I can say is that I have received replies to which it is impossible to give a Parliamentary term. To-day I have received a type of reply which, to use an Irish expression, is even worse than no reply at all. It was silence. As one who represents to some extent the Air Service in this House, it seemed right to me to ask whether, in view of the raids on several counties of this country, it was considered desirable to institute reprisals; and to that question no reply was forthcoming. I would like to tell the Prime Minister, if he were here, and as he is not here I would like to address myself to the Treasury Bench, which is unusually full, and say to them that it is a mistake to believe that because, for the past six months, there has been no agitation on behalf of the public for protection from Zeppelin raids, and no agitation to carry the air war into the enemy's country, that the public are in any way satisfied. I have held a number of meetings all over this country in the last six months and I have addressed some millions of people, and I can assure the Treasury Bench that the people of this country are not satisfied either with the air defences of this country or with the offensive against Zeppelin bases. I consider that we have—and, in fact, to my personal knowledge, we have—aeroplanes and men and bombs in this country to carry out reprisals. I would suggest to the Government that it is time that we took our gloves off in this matter as in some other matters in connection with the conduct of this war. Six months ago I offered the right hon. gentleman who is now Secretary of State for Scotland to lead him by the hand and show him these bombs and these machines and these men, and now I repeat that offer to anyone on the Treasury Bench who will accompany me. I would like to ask how many Zeppelin bases have been bombed or attacked during the last six months? Surely the authorities must have known that the only reason why we were not attacked was that it is not a Zeppelin's business to attack by day, and that these attacks would take place immediately these conditions were propitious. At the present time we may say that the Zeppelin season has commenced, and unless some steps are taken, steps for the more adequate defence, or at least unless the public are shown that it is our intention to act in this matter, I think that the agitation that we had six months ago will be repeated. I would like to ask the Government to tell us how much damage it is necessary for Zeppelins to do before any definite action is taken. I wonder whether if a well-directed bomb were dropped in the centre of this House some action would be taken—whether it would do any great harm it is not for me to say, but I think it would have this effect, and it would wake the Government up in this direction at least. In the last three days I have had many telegrams and letters from all over the country with reference to the raid on Saturday night. I know that a mere Zeppelin raid is not a matter that this House regards as a very serious thing, and I know that this House has very many serious questions to deal with. There are so many broken pledges of the Prime Minister which had to be shifted, twisted or turned, and there are so many excuses which have to be given to all those whom he has deceived, that when it comes to the question of a mere Zeppelin raid, of course, in American parlance, it does not cut much ice; but it does cut a considerable amount of ice with those people who are interested in the Air Service of this country. I have pointed out before that the fact that no military damage is done is not the whole story. You cannot have a raid by one or 10 Zeppelins, dropping one or a thousand bombs, and say that no military damage is done. There is military damage done if thousands of special constables are kept up till 3 o'clock in the morning, as they were to my personal knowledge yesterday morning.

Mr. J. Samuel: They do not object.

Mr. Billing: But most of these men are carrying on work of national importance, and if they spend the whole night walking about with a whistle and a stick they cannot do their work next day with the same amount of energy with which they would otherwise do it. Not only that, but these raids hold up munition workers and trains and transport throughout the country, and that is a serious matter. The Zeppelin season has now commenced just before the House of Commons adjourns, which it will do, and leave the country to its fate until we meet again in October. But I think before we adjourn we ought to have some sort of undertaking from the Prime Minister that some form of offensive which is the real form of defence by the Air Service will take place. Another matter I would like to call attention to are the very foolish inspired communications which are issued by the Press Bureau to the public. Only yesterday I read of a case in one of those communications of a pilot who engaged a Zeppelin 30 miles from the East Coast. He aimed two trays of a Lewis gun into the Zeppelin, and in putting a third tray the gun burst and stunned him. I have used a Lewis gun myself many times, and I have never known anything likely to burst and stun the pilot without doing him pretty considerable harm. Then it is stated that the pilot was stunned and became unconscious—this was evidently a single-seated machine—and when he recovered consciousness the Zeppelin had disappeared. That is the sort of story which might be told in the nursery, but to anybody who understands aviation it is an insult to his intelligence to issue such a communication as that. The pilot's name was not mentioned, and presumably the pilot was the only one present, and therefore the only one to give the story. We all know that to engage a Zeppelin with a machine gun unless it has explosive bullets is not much good, but to issue such a statement and to bring it out in the Press in big headlines is really too fatuous for anything. It is typical of what the Government do all day long. They are using the floor of this House as a megaphone to shout statements to the public, which before very long are found to have no foundation in fact. I was lunching to-day with some of the finest air pilots, and they simply laughed at the report authorised to be issued by the Press Bureau. There is nothing wrong with the pilots. I think the House admits that, and I think the country admits it. We have the men, and they are quite prepared to go anywhere and do anything, and they have all the bombs and the machines as well.

As far as these raids which I have been referring to are concerned, I quite understand that the business of the Army Flying Corps is being carried out now a great deal better than has ever been the case before. They are doing their work, and they are occupied. I was referring on the raid question more to the Naval branch—the naval wing—of the Royal Flying Corps. At the present minute I think I can say that, with the exception of a few aeroplanes which they have in France, they are neither occupied nor justifying their existence or expense, and there is a very strong undercurrent of dissatisfaction throughout the Air Service. At the Air Inquiry—to which I cannot refer as the report has not yet been issued—I asked that the Royal Naval Air Service should be inquired into. Whether the First Lord of the Admiralty did or did not threaten to resign if that was done I cannot say. Anyhow, it has not been inquired into, and unless some drastic reforms take place in the naval branch I shall have things to say on the floor of the House of Commons, which I think will justify an inquiry.

Mr. Jonathan Samuel: Do I understand the hon. member to say that the other part of the Air Service is now perfect?

Mr. Billing: Not perfect. I should say that the other part of the Air Service is now much more efficient than it has been at any other time during this war.

Mr. Lynch: At this juncture I wish to rise on a point of order. My reason for interrupting the hon. gentleman is that his speech is so important that it ought not to be heard at 1 o'clock in the morning. We are here through having been deceived, no doubt, quite inadvertently, by the Prime Minister himself.

Mr. Deputy-Speaker (Mr. Maclean): That is not a point of order.

Mr. Lynch: Will the Home Secretary move the Adjournment?

Mr. Billing: I have not very much more to say. So far as the reports which I asked for earlier in the sitting are concerned I desire to put this to the House. I asked the Prime Minister that a certain report which had been made by the Minister of Munitions on a firm of engine-makers should be either laid upon the Table of the House or handed to the Air Committee. The reply I received was, "We know nothing of such a report." Are we to understand that a Government Department, having been given a certain amount of particulars and the date of a report, finds it absolutely impossible to trace that report from one Department to another? I will give all the assistance I can to the hon. member for Rugby (Major Baird) in the matter. It was a report made by the Minister of Munitions on the firm of Austin, engine-makers in Birmingham. I have seen the report, and so I know that it exists. In fact, I have a copy of it, and if it is not produced I shall read it to the House. That report states that the Royal Aircraft Factory engine is a mechanical impossibility and an engineering scandal, that it has caused more trouble, friction and delay in their works than any other proposition the firm has ever had to deal with. The report states, or infers, that it is in the interests of the country that these engines should not be made. Yet they have been ordered in thousands.

Sir A. Markham: Who made the report?

Mr. Billing: I do not think I can say who made the report, but if the Government say it is not in existence I will hand a copy to the hon. gentleman representing the Air Committee on the Treasury Bench. But this report must be forthcoming. It should be handed to the Air Committee as something on which to base their decision as regards this particular type of engine, which, when one has done and said all, is the crux of the whole question. It is the engine which caused me to make the speech I made in this House some months ago when I said—as I repeat—that it was tantamount to murder to send men up in machines engined with this type. Gradually but surely all the people who have identified themselves with air reforms in this country are beginning to appreciate that this engine is not only a mechanical impossibility, but a scandal, and I consider it is most essential that the Air Committee should have that report.

Then we had the Committee that reported on the Royal Aircraft Factory. They go down there and make a report at some considerable length. What is the result? The Air Board is another organisation which the Government has brought into being to defend themselves on these air problems, and Lord Curzon has said that his report is tantamount to nonsense, and that they do not agree with the findings of the report. I should like to ask what is the good of appointing an expert Committee to go down and report on a factory, and when they report and say the factory is this, that and the other, the Air Board say, "We don't agree with you at all." In the meantime an Air Committee is reporting on something else, which, when you have done and said everything, is only half, and the lesser half, of the service. What will be the position if Lord Curzon takes up the same attitude to the Air Committee? No, I really think it is time that the Government and the country took the air services of this country into serious account. It is reasonable, I submit, for some of us who fight, perhaps, a lone battle in this House with our particular beliefs and particular work, to take exception to the evasive replies which we receive from the Treasury Bench. I cannot expect Members of this House who are interested in other matters to be interested in the air. But I do think I have a right, and do say that it is my duty, to deal with this problem. I was returned to this House on a very definite mandate, from a constituency which had suffered considerably, to try to get some reforms brought about in our air services, and of the methods I have adopted in this House and outside to obtain those reforms I am the better judge. Some reforms have been carried out, but there is a very great deal more to be done. I do not wish to detain the House any longer. I simply want to say that I do protest against dealing with air raids as we are dealing with them and not retaliating in any way whatsoever, and I appeal to the Government for action in this matter, at least, if they have not the courage to take off the gloves in other matters. I am perfectly confident that the vast majority of the British people would be behind them if they would give orders that all the men and all the machines and all the bombs that are at present in this country doing nothing were to be employed in returning the raids and retaliating on the enemy for the raids they are making over this country. There is absolutely no reason why that should not be carried out, and if the Prime Minister would advise our enemy that for every raid that takes place over this country we would raid Germany on two occasions while we had a machine and a man left it would do more to stop Zeppelin raids than any amount of high faluting talk which takes place in this House very frequently in my presence.

Major Baird: The hon. member referred quite naturally to the reappearance of the Zeppelin raiding season, and invited the Government to announce their determination to make reprisals. I cannot imagine a more unpractical way of dealing with the question than to say in this House what we intend to do with regard to the enemy. Surely nothing would please us better than if the Germans announced to us when it is their intention to raid this country. I must say that the hon. gentleman's closing remarks, in which he said that he advocated all the men, all the bombs, and all the machines now in this country, which are doing nothing, being sent over to raid Germany, show in an hon. member who has had the experience he has had in the Air Service an extraordinary forgetfulness——

Mr. Billing: I was referring to suitable machines.

Major Baird: That was a very important omission. The hon. member said, as he has said in the country, that all machines in this country which have duties allotted to them by competent airmen should be taken off those duties and sent to raid Germany. In the first place, a great many of them could not go to Germany. As the hon. member knows, they were not built to go to Germany, and to send officers off on machines of that sort would indeed be murder, to use an expression which the hon. member has employed in connection with the Air Service. It is very unfair to the Air Service to use expressions like that, particularly when they come from an hon. member who has belonged to the Naval Air Service, and therefore speaks with some authority. That the hon. member should make use of an expression of that kind is very unjust and very unwise, and is likely to create an impression in the country which would be most unfortunate. The hon. member alluded to large stores of explosives. I should have thought he would have noticed from the morning newspapers that we dropped a little matter of 7 tons of explosives on the German lines yesterday from the air. That was reported in the *communiqué* of the Army, and the hon. member really must allow the officers who are directing our operations as a whole to decide where we can use our forces most effectively. If you have a choice between dropping explosives on the fighting men, ammunition trains, depôts and artillery of the enemy in the field on the one hand, and on the peaceful towns where the women and children belonging to the soldiers are living on the other, I for one would plump for dropping those explosives on the soldiers every time.

I venture to think when there is talk at large about going to Germany directly a Zeppelin shows its nose over here that we prefer a very much more honourable means of retaliating, not on the women and children of Germany, but on the soldiers of Germany, which is what we do. I do not for a moment say that the time may not come when there may be unpleasant surprises in store for Germans in their own country, but it would be extremely unwise to say anything on that point, or to announce in this House what was our intention in that respect. The hon. gentleman referred to the men, and the machines, and the explosives to which he was prepared to lead anybody by the hand. We know quite well that we have the machines, but I venture to remind him that they are allotted to specific work; that the necessary rising up of machines is immense in the conduct of operations such as we are engaged upon now, and really I do think the hon. gentleman exaggerates if he imagines that there is a large stock of machines in this country that could be put to this use. Certainly they are not suitable. They have duties which they perform day and night, and I do not think I should have any difficulty in persuading him in private, as I have already had to do, that the machines are there and are rendering very good service.

With regard to the employment of special constables on the occasion of Saturday night's raid, I don't know what that trouble was. We do have special constables, and when a man undertakes the duty of being a special constable he is liable for duty when Zeppelin raids take place as well as anybody else. I do not see where the trouble comes in there. As regards the *communiqué* issued in connection with a combat between a Zeppelin and a naval aeroplane off the coast, I think the hon. member failed to notice that the *communiqué* was issued by the Admiralty. If he had noticed that, doubtless he would have called the attention of the Admiralty to this matter.

Mr. Billing: Am I right in supposing that the hon. and gallant gentleman represents the Air Service or the Air Services in this House—military, naval, or both?

Major Baird: The functions of the Air Board were laid down quite clearly in its reference, and I need not weary the House with that, and the hon. gentleman would not expect me to remind him of a subject which he is perfectly capable of understanding. Our reference was quite clear. We do issue a certain number of *communiqués* for the Royal Flying Corps, but the Admiralty issue their own *communiqués*. I do not think it is a matter of any importance, but it is the fact, and I hope the hon. gentleman will not think it discourteous on my part if I do not deal with that particular point.

Mr. Billing: There is still some confusion, then.

Major Baird: As regards the answer I gave the hon. gentleman to-day, he said I gave no definite reply. I can only say that he asked rather an elusive question, because if he had given in that question the information he gave in the House this evening a great deal of time would have been saved and the hon. gentleman would have been saved the inconvenience of receiving an unsatisfactory reply. I said in this reply that if he would furnish us with more information we would cause search to be made and endeavour to pacify him. He has complied with that request, and I will certainly carry out my part of the bargain. With regard to the answer of the Prime Minister it is no part of my functions to deal with that, but I do think the hon. gentleman should realise that he did not give notice. His question was not on the Notice Paper, and the Prime Minister was, therefore, not able to prepare an answer to deal with it. I think I have dealt with all the facts the hon. gentleman has raised, but if not I shall be very happy to do so.

QUESTIONS.

Air Raid Reprisals.

Mr. Pemberton Billing, in the House of Commons on August 1st, said:—In view of last night's Zeppelin raid over seven counties, may I ask if the Prime Minister will now consider the advisability of reprisals? [Hon Members: "No!"]

The R.A.F. and the Ministry of Munitions.

Capt. Bennett-Goldney asked the Prime Minister if he would now confer with the Secretary of State for War as to the advisability of placing the Royal Aircraft Factory under the direction of the Minister of Munitions, who is already responsible for the supply of all aircraft weapons and ammunition?

Major Baird (representing the Air Board): The suggestion has been considered. The Royal Aircraft Factory is primarily and mainly an experimental establishment. It is consequently essential that it should be in close touch with and under the direct control of the Director-General of Military Aeronautics at the War Office, who is responsible for the development of military aircraft. It is, therefore, not thought advisable to place the factory under the Ministry of Munitions.

Aircraft Engines.

Mr. Billing asked the Prime Minister whether he will give instructions for the Report made by the Ministry of Munitions, and dated June 27th last, upon the labour conditions in connection with the manufacture by a private firm of aircraft engines of Royal Aircraft Factory design to be laid upon the Table of this House?

Major Baird: I regret that the information given in the question is not sufficient to enable me to trace the Report which the hon. member has in mind. If he will supply me with fuller particulars further inquiry will be made.

Zeppelin Casualties and Compensation.

Mr. Hogge, on August 2nd, asked whether there is any fund to meet the case of a woman who loses her support through casualties to her sons due to Zeppelin bombardment?

Mr. McKinnon Wood: No relief is given from public funds in respect of injuries or losses sustained through air raids since the inauguration of the Government insurance scheme except in so far as property is insured under that scheme. I understand, however, that temporary assistance is given from the National Relief Fund in cases such as those referred to in the question.

Mr. Hogge: I am not asking about the temporary arrangements. Do the Government recognise a distinction between people who lose their lives in this country through attacks by the Germans from Zeppelins and people who lose their lives outside this country? Do they not propose to give some relief to people in that case?

Mr. McKinnon Wood: I cannot commit myself to any statement with regard to the future. I have stated the facts as they stand at present.

Reports on the R.N.A.S.

Mr. Brookes asked the First Lord of the Admiralty when he proposes to issue any further reports of the work of the Royal Naval Air Services, especially in view of the part its aviators are taking in the military operations?

Dr. Macnamara: I assume that by "reports" my hon. friend has in mind the despatches received from time to time from senior naval officers afloat and ashore, and published by the Admiralty. These reports cover the whole area of operations which are the subject of the despatch, and, as in the case of Admiral Bacon's despatch published last week, include the work of the Royal Naval Air Service. It is the intention as well as the practice of the Admiralty to continue the publication of such despatches. In addition to these formal reports, the Air Board also issue from time to time *communiqués* regarding the day to day work of the Royal Naval Air Service, based upon material supplied to the Air Board by the Admiralty.

Anti-Aircraft Defences.

Capt. Bennett-Goldney, on August 3rd, asked the Prime Minister whether his attention has been drawn to the increased height at which the newest Zeppelins are now able to fly; and if, although it may be undesirable now to let the public or the enemy know whether the effective range of the anti-aircraft guns now in use at home is sufficient to serve any useful purpose against Zeppelins flying at altitudes over 12,000 feet, he can reassure the populations chiefly concerned by a disclosure as to whether we may expect any genuine improvement in the real adequacy and efficiency of our anti-aircraft defences outside the area of London in the near future?

Major Baird: The Prime Minister has asked me to answer this question. As was recently indicated in answer to a question by the hon. member for Mile End, the development of the air defences of the country is proceeding as rapidly as the manufacturing output and the needs of the Navy and of our forces in the field permit. This development applies not to the London area only, but to the country as a whole. I am afraid that I cannot add anything to that statement.

Mr. Lynch: Is there a range-finder in these Eastern towns?

Hon. Members: Do not answer!

Major Baird: I should like notice of that question.

Co-operation in Anti-Aircraft Work.

Mr. Shirley Benn asked the Prime Minister if he will give the names of the officers or persons responsible for co-operation between the air services of the Navy and the Army during an enemy raid over the United Kingdom?

Major Baird (representing the Air Board): It would be undesirable to give the names of the officers or persons who, under the Field-Marshal Commanding-in-Chief Home Forces, on the one hand, as exclusively responsible for Home defence, and the Board of Admiralty on the other, as responsible for the defence of our shores, are engaged on the duties which the hon. member describes. But the hon. member may rest assured that there is effective co-ordination between the two services.

Mr. Benn: If I can show that there was not proper co-ordination between the two services the night before last, will the Government take action to see that in future there is?

Major Baird: Undoubtedly we shall be grateful for any information showing how the arrangements can be improved.

R.N.A.S. Stations and Zeppelin Raids.

Mr. Ashley asked the First Lord of the Admiralty whether a certain R.N.A.S. establishment was not informed of the Zeppelin raid on the night of July 28th; whether, in consequence, no machines were sent up though they were ready; whether this was owing to no instructions from the Director of Air Services having been received; whether explosions of bombs were distinctly heard and assumed to be gun practice; and what steps he proposes to take in the matter?

Dr. Macnamara: The attention of the Admiralty was at once called to the omission referred to by the officer in charge of the air station. The Admiralty immediately proceeded to deal with it.

Air Raids (Insurance).

Capt. Bennett-Goldney asked the Prime Minister whether, as apparently an entire fleet of Zeppelins has again been permitted to fly, with one exception, unmolested over several English counties and towns, he will consider the desirability of introducing fresh legislation to permit of a more equitable system of State-aided insurance against risks of injury or loss by enemy air raids; and, as although in contradiction to official pre-war prophecies there appears to be no immediate likelihood of preventing enemy aircraft from inflicting injury and loss upon the non-military populations concerned, if he will also consider the question of State obligation to compensate near relatives of persons who may be killed and injured by Zeppelins or other aircraft?

The Prime Minister: No, Sir, I do not think fresh legislation is called for on this matter. I may point out that in the two latest raids no casualties and no substantial damage were caused.

Non-Poisonous Dope.

Mr. Rowlands, on August 7th, asked the Home Secretary whether there has been a large increase of jaundice amongst the persons working with poisonous dope; if he will say what progress has been made with the experiments to produce non-poisonous dope; and is there a probability of it being supplied to the various works at an early date?

The Under-Secretary of State for the Home Department (Mr. Brace): I am pleased to be able to say that not only has there been a considerable decrease recently in the number of cases of jaundice due to dope, but that satisfactory dopes which are free from tetrachlorethane are now available in sufficient quantity, and that the War Office and Admiralty have directed their contractors to use only the approved dopes of this kind. It may be taken, therefore, that the danger from tetrachlorethane poisoning in this class of work has now been removed.

Mr. Rowlands: I take it that that dope is now being circulated to the manufacturers?

Mr. Brace: Certainly!

Anti-Aircraft Guns and British Aircraft.

Capt. Bennett-Goldney asked the Secretary of State for War (1) if his attention has recently been called to another instance in this country of our anti-aircraft guns firing at our own aircraft; whether in an official *communiqué*, which was issued for publication, the instance was described as a flight of enemy aircraft arriving over our shores and successfully driven off by the effective fire of our anti-aircraft guns; if he can say whether this official *communiqué* was withdrawn, and by whom; if a second but entirely contradictory *communiqué* was issued to take its place; if he can give the reasons why this change was considered necessary; if he will inform the House whether the details of this incident, as described in the first *communiqué*, were found to be untrue; if so, whether the real truth was disclosed in the second *communiqué*; if not, if he will explain the reason, and issue a full report of the incident referred to; and (2) whether, when our own aircraft were fired upon on a recent occasion by our anti-aircraft guns, our airmen were in any danger of their lives, and, if so, whether the *communiqué* describing the incident as enemy aircraft successfully driven off by our anti-aircraft guns may be relied upon as true, so far as the efficiency of these guns is concerned, or whether the airmen concerned were never in any danger, in spite of the firing, owing to the ineffective range of the guns?

Major Baird (representing the Air Board): Rare instances have occurred, as in the case referred to, of our anti-aircraft guns firing at our own aircraft, and are, it is to be feared, occasionally to be expected in aerial warfare. They have been adequately dealt with by the competent authorities, and no one but the enemy would gain by their being discussed in public. No such *communiqués* as are referred to were issued for publication, the incident being discovered before official notification could be made.

Mr. Billing: Would the hon. gentleman mind telling me who gives the order for firing the aircraft guns, or is it independent firing?

Major Baird: The officers commanding the battery give the order?

Mr. Billing: Can the hon. gentleman answer the question whether it is independent firing?

Major Baird: I cannot say what orders are given, but the officers commanding the battery give the orders.

Mr. Billing: Will the hon. gentleman find out?

AIRISMS FROM THE FOUR WINDS.

ZEPP. surprise raids.

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INSURE against Zepp. raids.

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ZEPP. raid surprises.

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INSURE against Zepp. raids.

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ZEPP. raiders and surprise packets.

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AMONG the Citizens' lectures in connection with the British Association Meeting at Newcastle-on-Tyne from September 5th to 9th, will be one on September 4th by Dr. Dugald-Clerk on Internal Combustion Engines.

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HOW imaginative minds have ever turned upon the fascinating idea of air conquest! The latest reference in this connection brought into prominence comes from the Rev. J. P. Bacon Phillips, of Crowhurst Rectory, Sussex, who points out that Sir Horace Walpole, writing in 1785 to his friend, Sir Horace Mann, made the following prophetic prediction: "I expect they will soon have an air fight in the clouds."

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HAVING the old Blériot in Mitchell's delightful "Aero" tea-gardens at Hendon for a garden ornament is certainly *some* brain wave.

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IT is not only of considerable interest to the general visitors —many of whom, no doubt, tell their friends with pride that they have not only seen aeroplanes in flight, but have *touched* and had tea under a *real* one—but it also has some historical interest. It is the machine poor Lee Temple used to fly.

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ELECTRIC control by whistling.

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WHISTLING *versus* Wireless.

– – –

CONTROL of Aircraft by Whistling. "Wait and listen."

– – –

WHISTLING as a "motive control" for aircraft, torpedoes and what not. "Wait and see."

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AFTER many months of strenuous work up at Birmingham, where he is connected with the Austin Co., Mr. J. D. North took a short "breather" in town last week. He had very sincere greetings at Hendon amongst his old friends who are still around the 'drome.

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THE new Grahame-White works just across the way from the old shops are progressing apace. Their completion will relieve some of the older shops where in the future only the erecting and metal work is to be carried out, the extensions being responsible for all the woodwork, &c. A large quantity of wood-working machinery of the most up-to-date type has already arrived, and is ready for installation in the new premises.

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MR. C. H. STEVENS, who, it may be remembered, had a very nasty spill while a pupil at the L. and P. School, resulting in a fractured leg, is out of hospital again. Even better news is that, under the tutorial care of Mr. Sykes, he is actually doing straights on the Martinsyde, although his leg is still in bandages.

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THE B.E. was NOT coming to take tea in Mitchell's tea gardens, though we thought it was.

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PERHAPS it was only coming to have a look at the old Blériot.

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ANYWAY we secured a good picture of it.

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CONGRATULATIONS to the British Caudron Co. on the way in which they have carried out what at first would appear an almost hopeless task, building a Renault engine into a Caudron machine. The result, not only bearing no resemblance to a makeshift job, but looking in fact as if the machine might easily have been originally designed for this engine, is a credit to the firm both as regards design and workmanship.

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ALREADY most of the special wood-working machinery is in place and running at the works of the Ruffy-Baumann School. Hendon-way contractors who are pressed with other classes of work, might be well advised to get into touch with the firm if they are in need of spare wings, ailerons, tail planes, &c.

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LOOPING the loop in the dark.

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SMILES made two at 9.45 on Friday evening. They had to light flares to guide him in landing. He made them outside, over the houses.

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SEEMS more sensational than safe.

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HE is, we believe, going to try 30 in succession. It may create a record, but is it wanted?

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BEATTY'S engine goes with a "snap." It snapped off the top of two of his fingers the other day. But "George" continues smiling. Because he has got a good thing.

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IT is an offence to photograph anything of a Service nature.

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A FRIEND got into serious trouble for photographing the old London to Manchester Farman last year at Hendon.

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YET there is a big enlargement of the U.C. 5 in a Cheapside shop, which shows something in the background that ought not to be shown.

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WORKERS are encouraged to work hard and take no holidays. Parliament takes eight weeks.

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NOT that it matters very much. But Mr. Asquith is to be seen going to the War Office every day.

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NOTICE to picture papers. Same old photographs will do.

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COBBLERS are notoriously ill shod. And doctors do not take their own medicines. But Members might make munitions.

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THERE is nothing new under the sun. Mounted on a flagstaff above one of the hangars at Hendon is a curious, long, sausage-like bag, open at one end, into which the wind blows so that it trails out like a pennant and thus forms an excellent weather-cock. The same sort of "wind bag" was used in Japan and China hundreds of years ago by, amongst others, farmers on their rice plantations.

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GOOD idea! The G.-W. "show" pusher biplane—minus engine and tail—is now, apparently, being used to absorb any excess of wind that may be blowing around and interfering with school work. It stands out on the field, securely staked and shackled, with its four-bladed prop merrily ticking off countless r.p.m., and thus absorbing the aforesaid wind.

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THOSE who have more work than they can keep pace with may be interested to hear of a private enterprise in the Lancashire district which has a useful assortment of lathes, and would be willing to subcontract for metal or wood parts. We shall be pleased to pass on inquiries.

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CHELTENHAM is on the Aeronautical horizon.

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THE current (August) list of ball-bearings which Messrs. Laurence Norris and Co. have in stock shows a very wide range. Those who are ever in the market for these fittings should see that they get the list regularly; they have only to drop a post-card to the firm at Imperial Buildings, Kingsway. By the way, the firm are now busy upon a very large contract for war purposes in Italy.

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WE wonder what the young man who "was dying for a smoke" thought when the Middlesbrough magistrates fined him 40*s.* for showing a lighted match in the dark street.

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THE new L. and P. premises in Collindale Avenue are gradually getting into shape, and machines are already in course of erection there. After the numerous practical demonstrations of strength and stability given recently, it should be worth while the authorities acquiring a few of these machines for school work.

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How about giant flying boats Edgware way?

Personals

Casualties.

Lieutenant G. V. Randall, attached R.F.C., son of Mr. W. B. Randall, engineer, and secretary to the Waltham Abbey and Cheshunt Gas Co., has been killed in action. He was 19 years of age, and went straight from college after the outbreak of war to the Military College at Camberley.

Lieutenant Douglas Birch Richardson, Royal Engineers and R.F.C., who has been killed, was the son of the late Mr. R. Richardson and of Mrs. Dunlop Anderson, 18, Ingestre Road, Oxton. He went to the Front with the Royal Engineers shortly after the outbreak of war, and was invalided home in the following May. Later he joined the Royal Flying Corps, and returned to active service in March last. Lieutenant Richardson was educated at Gresham College, Holt, Norfolk, and at the Liverpool University, afterwards joining a London firm of engineers.

Second Lieutenant John Raymond Boscawen Savage, R.F.C., aged 17, killed on June 18th, was educated at Mr. John's, Winton House, Winchester, and at Oundle. He joined the R.F.C. on his seventeenth birthday, received his pilot's certificate on October 18th last, his wings on February 3rd, and went to the Front in March. He was the last of the direct line of a fighting race—the Savages of the Ards, County Down. His father, Major Arthur Raymond Boscawen Savage, R.F.A., is fighting in the present war; his grandfather, Colonel Henry John Savage, 91st Highlanders, fought in South Africa against both Boers and Kaffirs; his great-grandfather, General John Boscawen Savage, R.E., fought in the Peninsular War; and his great-great-grandfather, General Sir John Boscawen Savage, K.C.B., K.H., commanded the Marines in the battle of the Nile. His uncle, Colonel Henry Savage (South Staffordshire), who is now the head of the family, has fought in the Zulu and South African campaigns. Lieutenant Savage was shot by the German airman Immelmann, in Immelmann's last fight.

Captain Arthur E. Stone, Royal Field Artillery (killed in action on July 24th), aged 37, was well known in Bristol from his connection with Messrs. George White and Co., in whose office he had been for about 20 years. At the outbreak of the Boer War, in 1899, he volunteered for active service in South Africa, and served with the North Somerset Imperial Yeomanry, and was one of those who formed the guard of honour when Lord Roberts entered Pretoria. Captain Stone will be remembered as Sir George White's private secretary for many years. He possessed exceptional business qualities, and rendered valuable services at the time of the formation of the London United Tramways, and later, when the business of the British and Colonial Aeroplane Co. began to develop, he was selected to control the financial arrangements, and was actively engaged in that capacity up to the time of the outbreak of war. He was an old artilleryman, and had always taken a great interest in the Bristol Artillery Volunteers, in which he served successively as gunner, bombardier, sergeant and later obtained his commission. On the outbreak of war he was one of the most vigorous recruiting officers in the South Midland Royal Field Artillery. Shortly after his brigade left for France he was promoted captain, and he had recently been appointed to the command of a battery. His brigadier-general, in writing to his relatives, speaks of him "as a gallant officer and an excellent battery commander, in whom he placed the greatest confidence."

Second Lieutenant C. I. Sandys Thomas, R.F.C. (killed in action on July 20th) was the younger son of Violet and the late Walter Sandys Thomas, of Llanthomas, Breconshire. He was 19 years of age, and was gazetted to the R.F.C. in June, 1916.

Major Herbert Phillips Fletcher, F.R.I.B.A., F.S.I., A.M.I.C.E., Middlesex Hussars, attached R.F.C., of Park House, Marden, Kent, died on August 2nd as the result of an accident while on duty, aged 44. He was in partnership with his brother, Mr. Banister F. Fletcher, as an architect, and was a barrister-at-law of the Middle Temple. At the outbreak of the war he was with his regiment, the Middlesex Hussars, and went with it to Egypt. He was then seconded to the French, and did reconnaissance work from Aden and Palestine on French seaplanes for some months, and was awarded the Croix de Guerre, both Military and Naval, for conspicuous bravery under fire. He was afterwards the officer commanding a British Observers' School at Port Said, and returned to England to take his pilot's certificate for future work with the R.F.C. Major Fletcher was the son of the late Professor Banister Fletcher, F.R.I.B.A., formerly M.P. for N.W. Wilts, and Mrs. Banister Fletcher, of Anglebay, West Hampstead.

Temporary Second Lieutenant John Robert Gobertus Whitehead, R.F.C., killed in an aeroplane accident on August 3rd, was the eldest son of the late John Whitehead, of Fiume, Hungary, and grandson of Robert Whitehead, of Paddockhurst, Sussex, the inventor of the Whitehead torpedo. He was educated at Eton and Trinity College, Cambridge, and married in April, 1912, Suzanne Béchet de Balan, and leaves one daughter. Being unfit for active service at the outbreak of war, he took up a position at the Whitehead Torpedo Works at Weymouth, which he relinquished as soon as his health permitted him to serve in a more active manner. He was gazetted to the R.F.C. last March.

Wounded.

Flight-Lieutenant William Brymer, R.F.C., who has been wounded, is the youngest son of Mr. G. Brymer, of Meifod. Lieutenant Brymer obtained a transfer to the Flying Corps from the Royal Garrison Artillery a few months ago.

Married and to be Married.

The marriage arranged between Donald, Second Lieutenant R.F.C., fourth son of Mr. S. David Coates, J.P., and Mrs. Coates, Homefield, West Dulwich, and Carol, youngest daughter of Mr. B. J. Greenwood, Shoreham, Kent, took place on August 3rd at the King's Weigh House Chapel, Duke Street, Grosvenor Square.

Items.

Flight-Lieutenant Laurence Irving, who has a Fokker to his credit, is a son of Mr. H. B. Irving.

Lieutenant G. K. G. Kerr, Shropshire Light Infantry, attached R.F.C., who was wounded in an air fight with two Fokkers in France, is now in hospital in London, and doing well. Lieutenant Kerr is the young actor who played with Mr. du Maurier in "Outcasts" at Wyndham's Theatre, and resigned his engagement to join the Army soon after war broke out. He had been in the trenches with the Shropshires for nearly a year, and joined the Flying Corps at Easter. He is the only son of Mr. Frederick Kerr.

Lieutenant James Douglas Latta, R.F.C., who has been awarded the Military Cross for attacking two observation balloons, which fell in flames, is the younger son of Mr. J. G. Latta, a director of Messrs. G. and J. Weir (Ltd.), Cathcart. He was educated at University College School, London. On the outbreak of war he and his brother, Captain John Latta, also of the R.F.C., joined the London Scottish, but their inclination and mechanical bent drew them eventually to the Royal Flying Corps. He took his pilot's certificate in November, 1915, and has been on active service since. Lieutenant Latta has on several occasions fought Fokkers, his own machine being badly damaged more than once.

We learn from Mr. A. Browning-Paterson, the father of N. A. Browning-Paterson, R.A., attached R.F.C., who is reported missing, that although he is officially described as Lieutenant, he was gazetted Flight-Commander to act as Temporary Captain whilst so employed from July 3rd last, in accordance with the official notification which appeared in "Flight" July 27th.

Captain Lionel Wilmot Brabazon Rees, R.A. and R.F.C., who has been awarded the Victoria Cross, is a native of Carnarvon. His father, Mr. Charles H. Rees, was for many years colonel of a Volunteer battalion of the Royal Welsh Fusiliers. Last year Captain Rees received the Military Cross for bringing down three German aeroplanes though fighting at great odds.

Captain D. C. Symington, R.F.C., who had a serious accident recently while flying near Ashford, Kent, when, owing to engine failure, his machine came down and he was severely injured, is in the V.A.D. Hospital, Ashford, Kent, suffering from head injuries and serious concussion.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (*France*), *August 2nd*, 9.54 *p.m.*

"During the last 24 hours our artillery, in co-operation with the Royal Flying Corps, has destroyed seven gun emplacements and six ammunition dumps near Grandcourt, and also further gun emplacements in other parts of the Front.

"A few hostile aeroplanes have crossed our lines for a short distance, but were quickly driven back. One was brought down and another damaged.

"The enemy appears anxious to avoid aerial combats."

General Headquarters, August 3rd, 10.28 *p.m.*

"The enemy shelled villages near Arras and Armentières, and dropped bombs on the outskirts of some villages without doing any damage.

"Two enemy aeroplanes were brought down in the northern section of our line, one of which seems to be of a new pattern. Three of our machines were brought down by gun fire."

General Headquarters, August 4th, 10.3 *p.m.*

"A patrol of four of our aeroplanes engaged seven enemy machines in a fight which lasted 45 mins. Three of the enemy's aeroplanes were driven down, and two of ours are missing."

War Office, August 4th.

"A report has been received from the General Officer Commanding-in-Chief in Egypt to the effect that on the morning of August 3rd two enemy aeroplanes attacked the shipping in Lake Timsa and the town of Ismailia. A large number of bombs were dropped, but no damage was done on land or water.

"On August 2nd an aerial combat took place between one of our machines and an Aviatik. The Aviatik was driven down, and was wrecked near Salmania."

General Headquarters, August 5th, 10.18 *p.m.*

"The enemy's aircraft showed little enterprise. Eight of their machines scattered when engaged by three of ours."

General Headquarters, August 6th, 9.50 p.m.

"The improved weather enabled useful work to be carried out by our artillery in co-operation with aeroplanes, and we destroyed several gun emplacements."

The despatch dated August 5th, 11.15 p.m., from the General Officer Commanding-in-Chief, Egypt, describing the successful repulse of the Turkish attack near Romani, concludes :—

". . . The work done by the Royal Flying Corps was excellent."

French. *Paris, August 1st. Afternoon.*

"Adjutant Non-commissioned Officer Lenoir brought down an enemy aeroplane—his fifth—which fell in its own lines north of Verdun. Another aeroplane was attacked by one of our machines west of Etain and was smashed on the ground."

Paris, August 2nd. Afternoon.

"On the Somme front our chaser planes were very active yesterday. Thirty-three combats were fought with the enemy over the enemy's lines. One German machine, which was attacked by two Nieuports, was seen to fall in flames, and 14 other German machines, which were seriously damaged, were obliged to come down or to drop headlong into their own lines."

Paris, August 3rd. Afternoon.

"On the Somme front Sergt. Chainat fought two air battles yesterday, and on each occasion brought down his adversary. These fresh successes bring the number of German machines brought down by this pilot to eight. Another German machine was attacked at close quarters by one of our machines, and fell in a damaged condition near Chauny."

Paris, August 3rd. Evening.

"During the night of August 2nd–3rd our bombardment aeroplanes dropped projectiles on the stations of Ham and Noyon. This morning an enemy aeroplane dropped a bomb on Nancy. There were no victims, and no damage was done. Pont à Mousson was also bombed, but to no effect."

Paris, August 4th. Afternoon.

"Last night one of our bombarding squadrons dropped 80 bombs of heavy calibre on the railway station of Noyon and on a munitions factory. Fifty bombs were dropped by another air squadron against the enemy's railway stations and bivouacs in the region of the Somme."

Paris, August 4th. Evening.

"A German captive balloon, hit by our fire, was destroyed near Ennemain, south of Péronne.

"During the night of August 3rd–4th our air squadrons carried out several bombardments in the region of Verdun.

"Thirty-two shells were dropped on the station of Stenay and 83 on the stations of Montmedy and Sedan, and on the bivouacs in the region of Danvillers."

Paris, August 5th. Afternoon.

"On the Somme front our chaser aeroplanes fought 17 battles, in the course of which two enemy machines were badly hit and came precipitately down in their own lines. Two other German aeroplanes were brought down in the region of Verdun, one falling near Avocourt and the other near Moranville."

Paris, August 6th. Afternoon.

"Last night our air squadrons dropped 40 bombs on the region of Combles, 84 on the station of Noyon, 30 on the stations of Stenay and Sedan, 40 on the station of Conflans, 60 on the station and railway works of Metz-Sablons, and 40 on the military establishments of Rombach (north of Metz). Several of these squadrons made two consecutive flights, and one of them no less than seven during the same night.

"On the Somme front two German captive balloons were set on fire by our aircraft. One German aeroplane dropped four bombs on Baccarat. There was no loss of human life, and the material damage was insignificant."

Paris, August 6th. Evening.

"This morning one of our pilots brought down successively two enemy machines in the region of Verdun. One of them fell in the French lines and the other between the trenches of the Germans and our own. Also this morning, after a fight with one of our aeroplanes, another German machine was forced to land in our lines at Moyenneville, north of Estrees. The two enemy aviators were captured. The machine, which is of a new pattern, is intact."

Paris, August 7th. Afternoon.

"On the Somme front our flying corps fought a number of battles yesterday. Three German aeroplanes were brought down, one near Roiglise (south-east of Roye), a second near Omiecourt (south-east of Chaulnes), and the third north of Nesle. Three other enemy machines were badly hit and forced to land in their own lines. Finally, two German captive balloons were destroyed by our aeroplanes. Last night our squadrons carried out the following bombardments : 20 bombs were dropped on the Metz-Sablons railway station, 30 on Thionville railway station, 25 on the factories at Rombach (north of Metz), and 12 on bivouacs near Etain."

Russian. *Petrograd, August 1st. Afternoon.*

"In the *communiqué* of July 25th it was stated by error that the aviators Staff Capt. Beridze and Lieut. Rtichtcheff perished as heroes after their machine was bombarded by the enemy's artillery. The correct version is that one of our Voisin aeroplanes was attacked by a Fokker, and after a duel caught fire, and fell into the enemy's front line."

Petrograd, August 2nd. Afternoon.

"An enemy aeroplane dropped bombs near Ussitchni, on the road from Vladimir-Volynsk to Lutsk, on a convoy of wounded, killing or wounding afresh 20 men. The aeroplanes also dropped bombs on a divisional hospital, killing one wounded soldier and eight attendants."

Petrograd, August 3rd. Evening.

"In the Vorobievka region, east of Czerny, nine enemy aeroplanes flew over our encampments. During the fighting south of the Dniester, in the direction of Stanislavoff, the regimental chaplain, Kastorski, was wounded."

Petrograd, August 7th. Afternoon.

"An enemy air squadron of seven aeroplanes bombarded several places in the region east of Stokhod, causing only insignificant damage."

Italian. *Rome, August 2nd.*

"As enemy aircraft last Thursday had attacked Italian open towns on the Lower Adriatic, without any military object, one of our strong Caproni squadrons on Tuesday bombarded the Whitehead torpedo and submarine works, 2 miles west of Fiume. In spite of the heavy fire of the anti-aircraft artillery and the attacks of enemy aeroplanes, our airmen succeeded in dropping four tons of high explosive, which did much damage to the works and set them on fire.

"During the air fight one enemy aeroplane was brought down above Muggia. One of our Caproni was observed landing near Volosca, but the others returned safely.

"Nine aeroplanes this morning very effectively bombarded Durazzo, dropping many bombs on the landing stages, barracks and aviation station, which was repeatedly hit. All our machines returned safely except one, which was forced to land in enemy territory, as it was damaged."

Rome, August 5th.

"An enemy aeroplane dropped bombs on the railway station of Bassano, hitting some trucks. The casualties were one killed and two wounded.

"A squadron of our Voisin aeroplanes dropped 35 bombs on the railway station of Nabresina. Good results were observed."

Rome, August 7th.

"A squadron of our Caproni aeroplanes bombarded the railway junction of Opcina under unfavourable atmospheric conditions, driving back hostile aeroplanes, one of which was brought down. One of our aeroplanes failed to return.

"On the night of August 5th and during the day of August 6th some of our torpedo-boats made demonstrations against the enemy coast between Duino and Miramar, near Trieste, during which they were attacked by enemy aeroplanes without suffering any damage."

Belgian. *Havre, August 1st.*

"In a *communiqué* summarising the operations of the Belgian troops in East Africa from July 3rd to 20th, it is stated: 'During the same period a squadron of hydroplanes at Lake Tanganika showed great activity. The defences of Port Kigoma and the enemy's ships in the harbour were bombarded nearly every day.'"

German. *Berlin, August 1st.*

"Unimportant military damage was caused by the dropping of bombs on Wervicq, Belgian Comines, and other places behind our front. Numerous victims were caused among the civilian population. An enemy aeroplane was brought down yesterday, and another on July 30th, by our anti-aircraft guns within our lines in the Somme region. Another aeroplane was brought down yesterday in aerial battle near Lihons."

Berlin, August 2nd.

"The enemy aeroplane attacks against the villages behind the northern part of our front were repeated. There is hardly any question of military damage; the losses among the population increase. According to supplementary reports, Arlon, in Belgium, was also attacked in the night of July 31st to August 1st. The Jesuit Convent and the church were struck. Three enemy aeroplanes were brought down by our anti-aircraft guns, viz., north of Arras, south-west of Bapaume, and near Pozières, whilst one was shot down in aerial battle near Monthois."

Berlin, August 3rd.

"Russian aeroplanes were shot down near Rozyszcz and to the east of Torczyn."

"Several German seaplanes early in the morning of August 2nd again attacked the Russian aeroplane station of Arensburg (Olsel Island, Gulf of Riga), and obtained several hits on the establishments there. Russian battle-aeroplanes ascended to repulse the attack, but were driven off. Our seaplanes returned undamaged."

Berlin, August 4th.

"In an air fight near Lens, Lieut. Mulzer brought down his ninth aeroplane, and Lieut. Frankyl, the day before yesterday, near Beaumetz, his sixth. Our aviators also shot down an enemy biplane yesterday, near Peronne. Two others were brought down south-west of Arras and near Lihons.

"Our anti-aircraft fire brought down two aeroplanes, one near Berles au Bois, south-west of Arras, and one near Namur. The latter belonged to a squadron which attacked Namur, but caused only small material damage."

Berlin, August 5th.

"In the Somme sector two enemy aeroplanes were shot down in air fighting."

Berlin, August 6th.

"Yesterday morning near the coast of Flanders, an enemy battle-aeroplane, after a long chase, was forced to fight by one of our seaplanes, and was brought down and completely destroyed.

"Our pilot, Naval-Lieut. Boemisch, thus destroyed his fourth enemy machine. A few days ago he forced another enemy aviator, by machine-gun fire, to land close behind the enemy's lines."

Berlin, August 7th.

"Repeated attacks of enemy airmen on the terrain behind our front were without any special effect. The repeated bombing of Metz caused some damage.

"Our air squadrons dropped numerous bombs on concentrations of troops on and north of the railway line between Kovel and Sarny. The bombs were seen to take effect."

Austrian. *Vienna, August 3rd.*

"A squadron of our torpedo-boats on Wednesday morning bombarded military establishments at Molfetta. An airship shed was wrecked, one factory was set on fire, and another damaged.

"During the morning hours of the same day five enemy aeroplanes dropped bombs on Durazzo without causing any damage. They were pursued by our seaplanes. One enemy aeroplane was brought down some miles south of Durazzo by one of our seaplanes and captured in an only slightly damaged condition. The two occupants of the machine fled. Later one of them, an officer, was captured by our troops."

Vienna, August 5th.

"Our airmen successfully bombarded Bassano."

Vienna, August 7th.

"During yesterday afternoon an enemy airship coming from the south-west, and flying at a great height towards the Isle of Lissa, fell in the sea in flames.

"An Austrian torpedo flotilla was only able to save the débris of the balloon's envelope. None of the crew could be found."

Turkish. *Constantinople, August 2nd.*

"North-west of Katia our aviators dropped bombs and successfully attacked with machine guns the English positions and camps near Mahemdia on the coast."

Constantinople, August 3rd.

"North of Katia an enemy aeroplane was driven down, damaged by our fire on the coast. The occupants of the machine fled after setting the aeroplane on fire. One of our patrols which had pursued the damaged machine drove off some enemy cavalry which had come up, and captured the aeroplane's machine gun and other material."

Constantinople, August 4th.

"East of Katia one of our aeroplanes, by dropping bombs, forced the warship to cease fire and withdraw."

Constantinople, August 5th.

"An enemy aeroplane which appeared over Birhassana, about 27 kilometres south-east of Ibne, was driven off by our fire. Three enemy aviators who threw bombs unsuccessfully on our troops near Katia were driven off by the attack of our aeroplanes, which ascended to engage them, and the fire of our anti-aircraft guns."

From Other Sources.

The *Times* correspondent, writing from the British Headquarters on July 20th, says:—

"At the same time our airmen are doing the enemy a great deal of damage. I understand that on one part of the front they have been dropping bombs, whenever the weather permits, behind the German lines, on his communications, on depôts and railway lines, on marching troops, or wherever they will cause most annoyance.

"One hears extraordinary stories of the audacity with which our aeroplanes sweep down close to the ground and use their machine-guns on bodies of troops below. How long it will last one cannot say, but for weeks past now, since our men have had a fair chance in comparison with the enemy, we have so completely held the upper hand in the air that the enemy's air service, whether for observation or offence, has been practically valueless to him."

The *Daily Telegraph* Paris correspondent, writing on Sunday, says :—

"No more heroic deed has been recorded in this war than that of Sergeant-Major Marquart de Terline, who gave his life to bring down an enemy aeroplane. His machine gun jammed soon after an air fight began, whereupon he deliberately drove straight at his adversary, rammed his machine, and both aeroplanes dropped to earth with their passengers dead. Terline, who was 24, and had formerly served in the Cuirassiers, had been twice mentioned in Despatches, and had received the Military Cross for bringing down a Fokker. He has once or twice said, 'If ever I cannot shoot, I shall just go straight for the Boche aeroplane.'

"The fight began at 4 a.m. on Thursday, when an Albatros, driven by a well-known German aviator, a giant with red hair, nicknamed by the French Arminius, appeared over the lines, making for Chalons-sur-Marne. In a few moments three French flying men were in the air after him in wild pursuit at 80 m.p.h. In spite of an incessant fusilade the enemy was apparently unhit, and he was nearing his own lines, while munitions were giving out. The three Frenchmen resolved on desperate tactics. They endeavoured to surround the enemy, and, should firing fail, to bring him down in sheer collision. Two of the Frenchmen accidentally ran into each other, and both machines fell, the aviators eventually landing safe and sound.

"Terline was left alone, still firing his machine gun, with the Albatros, mounted by two men, a pilot and an observer. Suddenly his gun jammed. The enemy was some 60 ft. below him, nearing his own lines. Arminius was still firing his machine gun, and also shot with a carbine. Suddenly Terline came straight down and drove his machine into the rudder of the Albatros. Both aeroplanes fell instantly in collision, stuck to one another for some seconds, then parted in mid-air, and crashed to the ground just behind the French lines at 100 yards from one another. Sergeant-Major de Terline and his two adversaries had, of course, been killed almost instantly. Terline, whose heroic self-sacrifice had been watched through glasses by several officers, had been true to his word."

The *Times* correspondent at the British Headquarters writing on July 29th, says :—

"An extremely gallant feat was accomplished recently by one of our airmen, who fell in with a squadron of 10 enemy machines, attacked them single-handed, and forced three to the ground. He was wounded in the fight with his first machine.

"The whole thing was witnessed from the ground, and he was seen after the first combat to lose control of his aeroplane, and it looked as if he would have to come down. He regained control, however, and returned to the attack, and then drove down his other two victims. It was altogether one of the finest actions of this war, and the public will doubtless hear more of it.

"In the last two days the visibility has much improved, and there is, and will be, a great increase in aerial activity.

"I have explained in former messages why for some time past the conditions have been all against our airmen. Under protection of the bad visibility which has prevailed there is every likelihood that the enemy's flyers will have recovered something of their *moral*, and we must probably expect them to be attempting exploits which for some time past they have not dared. If so, we may be sure that their recovery will be short-lived, and we shall promptly re-establish our supremacy.

"In the bad weather the enemy airmen have had a chance to take a breath. Nobody who knows doubts that we shall soon knock it out of them again."

Writing to the *Daily Mail* from the British Headquarters on Sunday, Mr. W. Beach Thomas says :—

"At the same time German aeroplanes—which had almost vanished from the British side of the line—flew over and dropped some bombs. Many people, myself included, saw a German aeroplane for the first time since July 1st. In all respects the enemy is struggling, with labour and high cost, to recover a portion of the initiative which he has lost. The air pilots begin to be more active and courageous and to drop more bombs. The heavy and long-distance artillery is extending its range and volume. The supply of the small 'egg bombs' is large."

The *Daily Telegraph* correspondent in Paris, writing on July 26th, says :—

"Second Lieutenant Nungesser is officially announced to have brought down his tenth enemy aeroplane, but his official record does not at all represent his real record. He has, in fact, brought down 16 enemy machines, but six of these fell within their own lines, and, therefore, are not counted by the French command. Moreover, he has at least two enemy 'sausages' to his credit. Nungesser, owing to wounds, was finally invalided at the beginning of this year, but refused to be invalided, refused his three months' convalescence leave, re-enlisted at once, and started flying again in March."

The *Times* special correspondent at the British Headquarters, writing on July 25th, relative to the advance through Pozières, says :—

"In getting up his new guns he has been favoured by the bad visibility of the air. It is seven days since any rain fell, which, of course, has been advantageous to our troop movements. At the same time the atmosphere has been continuously thick and hazy, and the denseness is increased by the dust from the dry ground and the battle smoke. Aeroplane observation has been very difficult, for which the Germans have cause to be thankful. That is a condition which operates against us only, for the enemy has practically no observation from the air now under any conditions.

"It is true that in the last few days a few of his aeroplanes have ventured in the thick air on hurried incursions across the lines, but they have amounted to nothing. It remains as true as it was when this battle began that we have complete mastery in the air. Not only do we rule the skies above the lines, but we hold the enemy terrorised far into his own territory. Over his aerodromes our machines keep constant guard, so that his airmen can hardly rise, except under cover of the dark or in very thick weather.

"The French are following the same tactics. Some of our own airmen recently saw a beautiful sight when a flock of seven Fokkers tried to rise from the aerodrome at Cambrai. An equal number of French aeroplanes was waiting overhead, and, as the enemy machines came up, they swept down from the clouds, and the enemy scattered like a covey of partridges stooped at by a falcon, and all came fluttering to earth, in all parts of the horizon, wherever they could find landing.

"Whether with our own latest or with French machines, none of our men has now the least fear of a Fokker or anything else which the German can send up. But this is no guarantee that he will not soon have—perhaps is already building—something which will be more formidable. No effort must be spared to keep improving.

"Our flying men are fine beyond words. Given an equal chance they will always hold the mastery which they have won. And the air supremacy is a thing of simply incalculable value in this artillery war, wherein observation counts for so much."

In a vivid story describing some impressions of the battles of the Somme, Lord Northcliffe, in the *Times* of August 7th, says :—

"From north to south is an irregular chain of watchful observation balloons. High and glittering in the sunshine are planes, directed as often as not by boys who in happier times would be in the boats or the playing fields. Their heroism during the last few weeks has never been equalled, except in this war. . . .

"The war-plane of 1916 flies upwards and away with the speed and grace of a dragon fly. She has been made perfect and beautiful for her flight by skilled expert mechanics. When she returns after, let us hope, her conquest, the boys who have escorted her in the air (one of these I met was at school last year) hand her over again to those attendants to see if she has any rent in her gown or other mishap which may be speedily mended. When, therefore, you see an aeroplane you must realise that each machine has its staff. Speed and efficiency being prime essentials of victory, her caretakers must be skilled and *young*. As for her supplies, there must be at hand a great quantity of spare parts ready to be applied instantaneously, and there must be men, in case of need, who can either alter or even make such parts. There must be those who understand her camera and its repair, her wireless and its working, men who have already learnt the mysteries of the newest bombs, rockets and machine guns. I take the aeroplane as an instance because of its prominence in the public eye.

"What applies to an aeroplane applies in other degrees to every kind of gun, to every form of motor or horse transport, ambulances, field kitchens, filters, and to a thousand articles which at first sight do not necessarily seem to be part of war making."

A little pen-picture of the work of the kite-balloon at the Front was contained in the despatch of the *Morning Post* special correspondent with the British Army. Writing on August 3rd, he says :—

"Yesterday and to-day our artillery has been pounding away at the enemy with extraordinarily results. We do not know as yet all that has been accomplished, but the trustworthy reports of our observers—whose work has been facilitated by a clearer atmosphere than we have had for some time past—make it clear that we have 'knocked out' several important Boche positions, and have reduced others to a state of temporary ineptitude. For a good many days now the Germans, having brought up portentous reinforcements of heavy guns, have been searching vainly for our artillery emplacements. They have 'chucked about' a great deal of 'heavy stuff'—mostly at random, and the effect has been almost *nil*. This is due to the utter lack of success which has attended their aerial observations. Everybody is asking what has gone wrong with the air service of the enemy. One does not wish to be unduly optimistic, but whatever the reason may be the Boche airmen have suddenly developed a caution and a timidity which have come with the shock of a surprise to our own airmen, who are constantly flying over the lines of the enemy and are really puzzled to account for his lack of activity. I only wish those people who speak and write in the language of a foolish and unworthy pessimism about the 'command of the air' could see, as I do almost daily, our flying men careering across territory held by the enemy while hardly ever does a Boche 'plane dare show its nose across its own protected frontiers.

"The aeroplane acts as the eyes of our artillery, and our artillerists recognise the obligations they owe to it. Another department also of our air service is deserving of the highest praise—the kite-balloon section. The kite-balloon, or 'sausage,' has a fixed post of observation in the air. In the Army it is known as 'Rupert.' Why 'Rupert' I do not know, any more than anybody knows why the anti-aircraft gun is called 'Archibald.' I have visited 'Rupert's Retreat' when he has been at home to his friends. He is rather an uncouth-looking object. He really does resemble a sausage in the air, with a caudal appendage, the utility of which may not be disclosed. But he has wonderful eyes in his head, and from his fixed position he is able to note the effects of long-range artillery fire in a fashion which is extremely useful to the men at the end of our guns. Precisely how 'Rupert' does his work I may not disclose. But he is a wonderful creation. It is only within the past six months that he has been adopted definitely as a trustworthy adjunct of our military service. I have counted within the purview of vision as many as 26 of our 'Ruperts' in the air at one time. Our French Allies, too, have recognised his worth and use him freely. The Germans, likewise, have sausage balloons, but we have succeeded in 'strafing' a very large number of them, whereas ours are so well protected against enemy devices that the percentage of accidents is infinitesimal. All honour to 'Rupert' and the brave men who daily ascend with him into the skies. He is a terrible thorn in the flesh of the enemy."

Mr. Stanley Washburn, the *Times* Special Correspondent with the Russian Forces, writing from the Stokhod Front on August 3rd, says :—

"The German flyers have during the past week begun a campaign which can only be characterised as pure murder. Every day there are bomb raids here. The machines fly as low as possible, pouring machine gun fire into the panic-stricken populace, which bears the brunt of all these attacks. To-day's toll was 11 killed and 40 wounded. The latest form of bomb employed is one filled with fragments of broken glass, one of which killed a girl not far from my house. One bomb fell nearer still, a fragment striking the roof of my quarters. The hospitals here are also being bombed daily, the English hospital having suffered already twice from this atrocious practice. Many wounded have been killed by the bombs.

"A still more atrocious practice has lately been adopted. The airmen sweep down and drop bombs on the high roads behind the lines. Two days ago a German airman on the stretch of road between here and Lutsk, which is open country, discovering an unprotected column of ambulances plodding through the dust, planed down just above it and opened fire with a machine gun, killing 20 wounded men within. These carts with their canvas covers are unmistakable, and this act can only be characterised as wanton and brutal murder.

"It is unbelievable that the German higher authorities approve of these acts of aerial piracy. Certainly such atrocious deeds could be formally presented to the attention of the German Government through neutral channels. These daily scenes in the hospitals of little children with bandaged heads and dying women tend only to increase the *moral* of the Russians, while they have not the slightest military value."

The *Daily Telegraph* correspondent in Petrograd, writing on August 6th, says :—

"Two moving episodes of an intimate nature are reported from the Front. One is the death of the aviator Edward Pulpe, who, though born in Russia, and of Lett extraction, began his career in the French Army, and was only detailed to this front comparatively recently. While scouting on the Styr he was attacked by a Fokker, which was soon joined by two more apparatus of the same type. For an hour the unequal combat was watched with breathless excitement from the Russian lines, where the occasional rattle of flyers and machine guns was distinctly audible.

"At last it appeared that Pulpe's machine had received a vital injury, for it descended in a spiral from a height of 2,000 to 1,000 yards, and then fell like a stone to the ground.

"The aviator was still breathing when picked up, but expired shortly afterwards, without regaining consciousness."

Mr. W. Beach Thomas, the *Daily Mail* correspondent with the British Army, writing on August 5th, gives the following snap of the quick work of the R.F.C. photographers :—

"Nor is this the full tale of the efforts of the co-operation of different arms. Before noon to-day the airmen had taken and delivered to headquarters photographs of the captured territory; and these were already proving of service to the infantry in possession. So a complete circle of combined effort may be drawn. The artillery made possible the infantry attack. The airmen lent to the artillery the eyes that made their work effective; and, finally, the association of airmen and infantry acclerated the work of infantry organisation.

"When the airmen went out this morning at the favourite hour of all flying men in peace or war—the hour before dawn—they could see the ruins of Martinpuich (where our guns the other day lit a great fire) and our shells bursting here and there and everywhere over the hill and down the wide glacis which leads to the valley by Bapaume, and they knew that for the first time the infantry as well as they themselves had some direct glimpse of the same attractive scene. They seldom, if ever, had a greater compliment to their own enterprise."

The difficulties of air work in Egypt are well set forth in the following despatch from Mr. W. T. Massey to the *Daily Telegraph*. Writing from the General Headquarters in Egypt on July 18th, Mr. Massey says :—

"The brilliant work of a flight of the Royal Flying Corps during the operations in Darfur will rank as one of the finest efforts of our Army airmen in the war. The flight had some serious moments, when transport threatened to fail them, but energy, resource and the determination to succeed triumphed over all troubles, and the achievements are worthy of the page they will receive in the history of military aviation. The airmen had to move south at very short notice, travel by sea, rail and desert track for 2,000 miles before they could reach the barren spot from which they were to operate, to face all the difficulties of flying under tropical conditions with an equipment not designed to meet such special circumstances, and to fly in a country absolutely unknown to them and where maps were of little use. They were of infinite service to Col. Kelly from a military point of view, and one may hazard a prophecy that their exploits in the air helped to make Ali Dinar's people realise the Sultan's game was up, for though the natives were not astonished to see machines in the air, they were surprised beyond expression when men alighted from them. One who found speech was heard to say, 'The Government was always great, but now it is greater than ever.'

"In Darfur the weather breaks about May 25th with unfailing regularity, so that when it was decided on March 29th that a flight of the Royal Flying Corps should be detached from the Egyptian Expeditionary Force to take part in the operations there was very little time for preparation. On March 31st two officers left Suez for Port Soudan and Khartoum, and they were followed on April 7th by an advance party of a few officers and men with petrol, oil, bombs, transport tent sheds, and absolutely essential stores, and on the 20th the main body commenced the ten day's journey to Rahad, the railhead station south of Khartoum. The transport difficulties proved greater than anticipated. Stores and machines had to be got forward to Gebel-el-Hilla and Abiad Wells, 300 miles west of the railway, and the track to Nahud, half way, was quite unreliable, and lorries often stuck fast in the sand for days. The lorries had to take their own supplies of petrol and water, thus reducing the loads.

"Intense heat caused aviation petrol tins to burst, and evaporation was so great that a consignment of seven cases supposed to hold 56 gallons contained only 37 gallons. Plants with very sharp, hard thorns grew on the track and punctured tyres, and with the thermometer registering 120° in the shade it was desperately hard work to get up stores to be ready for the commencement of aerial flights from Hilla by May 12th. Most of the transport was done with camels—for at least 150 miles it was impossible to carry stores except in camel packs—and as the tents for machines each required 28 camels to carry them, the labour involved in transport may be imagined.

"An officer travelling in advance had selected spots for landing places, and had put down directional arrows of long strips of white cloth. These began to disappear, and the new robes of sheikhs' wives was evidence of the uses to which the pilfered material had been put. It was extremely difficult to find one's way in this country. In the mornings, when the camel transport trains were on the move, the airmen could pick up the exact line, but the camels were rested from 9 a.m. till 4 o'clock, and flying was dangerous after midday because of heavy storms. You get no warning of the approach of a 'haboob.'

"Extraordinary exertions were made to push forward the stores. Major Groves controlled matters at railhead, and every officer and man in the flight did more than a full share to see that everything needful was in properly-placed depôts on the line of route. A shed was built at Nahud for the two reserve machines, and the tents were ready at Hilla when two B.E.2c's landed in the aerodrome at dawn on May 11th. A reconnaissance had been arranged for May 12th, and a machine flew over El Fasher on that morning. The Royal Flying Corps had kept to the time-table despite the unexpected difficulties of the road, and all that was asked of the flight was done to the end.

"Much the longest flight in Africa stands to the credit of this flight of the Royal Flying Corps. On May 17th Col. Kelly's force was approaching Bir Meleit, an oasis 37 miles north of El Fasher, which was believed to be occupied by the enemy. It was important to know their strength, and also to ascertain whether there was water in the wells there. At dawn an airman started from Hilla (116 miles away) to reconnoitre. On his first journey he could not find Meleit, and he returned to the aerodrome at Hilla for further information. At 8.45 a.m. he again set out, and was successful. In flying over the place he was fired at, and a bullet hit the propeller. Bombs were dropped, and the airman came down low and opened machine-gun fire on the enemy, 500 of whom bolted and left Meleit open to our troops. On his return journey the airman dropped a message to Col. Kelly, telling him that there was water in the wells and that the enemy had fled. The airman reached Hilla at 2.15 p.m., having been flying for 8 hours out of a period of 9 hours, a feat which the Sirdar warmly praised in a speech of thanks to the Royal Flying Corps for their magnificent work.

"On some succeeding days there were further reconnaissances. Care was taken to measure the aeroplanes to see that they were standing the strain of unusual weather conditions, and the result was satisfactory. On May 23rd, as Col. Kelly was approaching El Fasher, Lieut. J. C. Slessor flew over the long stretch of country between the aerodrome and Ali Dinar's capital, and arrived at the moment when the force had gained a victory over the Sultan's troops. Lieut. Slessor saw 2,000 enemy cavalry drawn up in reserve outside the town, and attacked them with bombs and machine-gun fire. The horsemen scattered in all directions and took no further part in the fighting. When he began bombing the cavalry the Lieutenant saw a group surrounding a banner. He aimed a bomb at the party, and later information points to the Sultan having a narrow escape, two of his servants and his own camel being killed by the bomb.

"While attacking the cavalry Lieut. Slessor received a bullet wound in the thigh, and he had to steer with his hand instead of his foot on his way back to Hilla, his difficulties being greatly increased by a storm which broke suddenly. He brought the first news of the victory, and it was transmitted to the Sirdar from the aerodrome."

The *Times* correspondent at British Headquarters, writing on July 31st, thus describes the work of the bombers :—

"In the heat and haze which have been so prevalent of late, aerial observation for artillery purposes is very difficult, and to that extent the conditions are in favour of the enemy, who is the inferior power in the air. When he loses his observation he loses much less than we. However bad the air may be for certain purposes, nothing, since this battle began, has stopped our constant daily bombing from aeroplanes of important military points behind the enemy's lines. Many prisoners have spoken with terror of the damage which our aeroplanes have done, and declared that the bombing has been worse than artillery fire.

"It is immensely interesting to watch a squadron starting off on some distant and daring enterprise, but vastly more thrilling to see them come home. It is during the time that his men are away that the commanding officer has the most anxious time that he has to go through. I have shared, in minor degree, the anxiety of such a vigil.

"They had gone, very cheerfully and with almost no words said, on a long and dangerous flight over the enemy's territory. A large flight of our fighting machines, soaring in the sunlight, into and beyond the clouds, is a sight more beautiful than any flock of birds that fly. They had all disappeared into the distant blue, and nothing then remained but to wait. Would they attain their end? And if they did, how many would come back? It is nervous work waiting, even for an accidental outsider. For the commander who has sent them on their errand it is trying to a degree.

"At last they came—one singly, and, after some minutes, another and then another and another, till at last the tale was complete. They had all come home safely, and they had done what they had been sent to do—as the way of our airmen is—down to the last detail.

"Arrived at their destination, they had dropped down from the dizzy heights at which, on such an errand, they fly, and then methodically one after another, they had done their work. From that height an airman's trained eye can watch the course of his bomb in clear weather until it actually strikes the ground. So they had seen them fall; they had seen them strike the railway trucks and station and the depôt where the stores were kept. Each had had his object and each had found it. They had seen the bombs—explosive and incendiary—strike true, they had seen the wreckage and the smoke and the flames, and they knew that their work had been thorough. And only the last had been fired at.

"At less than 2,500 ft. an anti-aircraft gun should have little trouble in finding an aeroplane. Perhaps the men with the 'Archies' were having their after-luncheon nap. Probably they had had beer to drink—and the day was very hot. So all our machines but one had dropped their bombs—not hurriedly but with precision—before the enemy's guns spoke—and then they spoke harmlessly.

"'Oh, yes; they came pretty near,' the pilot of the last machine said casually, 'nothing unusual.' For these men to have the shells exploding 'pretty near' about their ears is a daily incident. They merely report it, saying that they were fired at by a gun at such-and-such a place much as if they said that they had lunched there.

"I have already said, in a former message, that one result of this thick weather will probably be a recrudescence of enterprise on the part of the enemy airmen. Behind the protection of the haze they will have had time to get their courage up. And we shall beat them down again. So long as you at home make sure that our Flying Corps gets regularly the men and material that it needs you need have no misgiving about the future in the air.

"The enemy may splutter and let off fireworks now and again, but in the long-run we hold him here, and the French hold him no less decisively farther down the line. He may and will make dashes for liberty now and again, but he will never, I believe, get the upper hand of us again."

In a despatch, describing a flight over the British lines, the *Times* Special Correspondent at the British Headquarters, writing on July 28th, says :—

"We did not, of course, cross the lines, nor even go near enough to tempt the possible fire of an enemy gun. . . . .

"Straight below one as one flew over the nearer outlying trenches on our side, they were strangely distinct. . . . .

"Beyond was the terrible belt of smoke. Smoke, too, rose here and there on this side of the belt, and from where we were, sharpnel and high explosive shell alike seemed to be bursting on the ground. No sound of gun-fire or shell explosion reached one through the noise of one's own propeller and the whistle of the wind. Like the farmland and the villages, it was all part of a painted picture.

"One thing which the experience made me understand, as I had not understood before, was the amazing value of aeroplane observation. Proofs of it one has in many stories which one hears, and in the beautiful photographs with which our Royal Flying Corps keeps the Army supplied. Those photographs are wonderful in their detail, but still more wonderful is the clearness with which each detail down below stands out before the eyes.

"Another thing which it taught me also was the joy of flight. It was, my pilot told me, a bumpy day, and I was glad. I knew that we bumped, certainly, and found that there are two kinds of bumps. In one you sensibly hit something hard, as a boat is buffeted by a sea. In the other you find nothing beneath you; but you drop, the bottom having fallen out of things, as when a lift begins unexpectedly to descend. I became familiar with both varieties of bumps and disliked them equally, and should have been disappointed if the expert had told me that it had been smooth.

"They had told me that I should hate it when we banked, but they were wrong. It was merely strange and infinitely novel and delightful, while as for the landing, which they said was worst of all, there can be no more gloriously exhilarating thing in life than that steep glide, when the propeller drops its note to a gentle purring, and the machine sweeps, like some fairy motor-car, dropping, with the clutch out, on frictionless bearings down the face of a hill of oil, from cloud-level to tree-level, to grass-level, there to land, with hardly a jar, and bound again and rush across the open space of turf, swinging round in a gentle curve until she stops with her nose to her own hangar like a well-handled horse pulling up at his own doorstep.

"Another thing which I learned was the great difficulty of seeing another machine in the air. I saw none. But when I landed there were three within sight from the ground against the sky.

"My trip was only a trivial incident. But it has increased tenfold my already great admiration of the men who handle these machines as my pilot handled mine, who take them up to three and four times the height to which I went and do not stay on this side of that dreadful line of desolation, but pierce it and keep patrolling, day by day, those upper regions over the enemy's country, to find him when he rises there above the clouds and beat him down to earth again.

"War nowadays, in most of its aspects, is a terrible, sordid thing. But this fighting of the airmen is more than the warfare of any ancient heroes, and comes nearer to the battling of the old gods than anything that men have done or dreamed."

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QUARTER-MASTER TERLINE'S HEROIC SACRIFICE.

We have already recorded the heroic deed in which Quarter-Master Marquart de Terline, of the French Air Service, when his machine-gun ammunition gave out, deliberately rammed the German Albatros machine which he and two brother pilots were chasing, rather than allow his quarry to regain the enemy's lines. The story has been carried a step further by the following account given to the Paris correspondent of the *Daily Telegraph* by Flight-Sergt. R———, one of the three pilots who took part in this air-flight. On page 663 we reproduce a drawing depicting this tragic incident, which must be classed amongst the outstanding deeds of the war.

"We left at 4 a.m.," says Sergt. R———, "an enemy air scout having been signalled. There were three of us, with Terline. I sighted the enemy 20 minutes later. I was up about 3,700 yards, and 20 kilometres from our line. My comrades were close by, and Terline and another first attacked. The Fokker tried spirals to escape. Being just above him, I came down beneath and behind, and at about 30 yards opened fire with a machine gun. It was then that the accident happened which misled Terline, and in which I had a miraculous escape. Our third aeroplane, not seeing me, came straight into my machine, and both aeroplanes, put out of action, dropped. Terline thought we had been shot down, and gave his life to avenge us.

"As for me, I was certain I was done for. My machine was dropping with a corkscrew movement, the motor still working, and the machine gun still firing. I was suspended beneath by straps to my seat. How I escaped and how I managed to stop the engine and the machine gun I have not the slightest idea. In a few seconds I dropped from 3,700 to 800 yards, and could not work the controls. At last I managed one, whereupon the aeroplane steadied and planed down.

"I was not sure, owing to the mist, whether I was in our own lines, and when on landing I saw soldiers running up I was just about to set fire to my machine, but I shouted, 'Qui vive?' and the cheering answer came 'Français.' I asked what had happened in the fight.

"'The Boche was brought down right enough,' they answered, and it was only later, when telephoning to the base, that we heard of Terline's heroic end."

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Damage from Bombs.

Owing to the heavy nature of his public engagements, Mr. Asquith has stated that he cannot receive the deputation from the Committee on War Damage who wished to put forward once more their view that the nation as a whole should accept responsibility for damage done by bombardment and hostile aircraft and give fair compensation to sufferers. The Committee suggest that no further premiums for a year should be paid, and that insurances under the Government scheme should be only for short periods.

London Casualties in Last Year's Air Raids.

In an official statement by the Chief Officer of the London Fire Brigade, Lieut.-Commander S. Sladen, the following particulars are given: "As a result of four enemy air raids on the London area in 1915 the Brigade received reports as to the deaths of 44 males and 34 females, and injuries to 94 males and 80 females. In addition, the lives of 20 males and 31 females were endangered by fires and explosions caused by the air raids, of whom 31 were rescued from positions of peril by the Brigade."

Two Propeller Accidents.

Accidents such as those which cost the lives of Major H. P. Fletcher and Air-Mechanic Dillingham are fortunately rare, and it is strange that two should have occurred within two days.

At the inquest on Major Fletcher on August 6th it was stated that after flying on the afternoon of August 1st, he came down apparently about 50 yards from where he wished to alight. A mechanic went out to assist, and after two unsuccessful efforts at starting Major Fletcher told the mechanic to get into the machine, and he proceeded to start the propeller. Having done so he seemed to lose his balance, and falling, forwards was hit by the propeller. He was terribly injured and died in the R.F.C. hospital two days later. A verdict of accidental death was returned.

Air-Mechanic Dillingham was assisting to start an aeroplane at Dover on August 2nd, when he was struck by the propeller and fatally injured.

Fatal Accidents.

Second Lieut. G. L. Backhouse, Norfolk Regiment, attached R.F.C., was killed in the evening of August 2nd through his machine overturning.

Second Lieut. J. R. G. Whitehead, R.F.C., was killed in an aeroplane accident on August 3rd.

German Pilots Killed.

The *Kreuz Zeitung* records the deaths of six pilots in aerial fights on July 29th and 30th, the names being Flight-Lieuts. Freytag, von Holtz, Siebert, Kisker, Crome and Naval-Lieut. Marmode, who was shot down in a seaplane. Other German papers last week also announced the deaths of Flight-Lieuts. von Ranke, von Demborne, von Tietze, Viehmier, Heinrich, Dubois and Richter, all since July 31st.

Austrians Honour Dead Italian Pilots.

From Fiume it is reported that the non-commissioned officer Caparello, the pilot of the Italian Caproni aeroplane which fell into the hands of the Austrians during the recent Italian raid in South Istria, was buried with military honours on August 3rd.

The Raid on the Ghent District.

THE *Telegraaf*, reporting the raid on the Ghent district on August 2nd says that 17 aeroplanes arrived over the town, and dividing into three sections bombed the St. Dennis aerodrome, the Mierelbeke goods station and the Gentbrugge Arsenal. An outbreak of fire was observed, and although the extent of the damage could not be ascertained, numerous Red Cross motor cars were afterwards on the streets. A later report from the frontier says that 40 aeroplanes took part. The *Echo Belge* gives the number of machines as 30, and says one squadron of 10 flew along the eastern frontier of Flanders at a height of 2,500 to 3,000 ft.

A Zeppelin Damaged.

ACCORDING to a frontier correspondent of the *Maasbode*, one of the airships, said to be the "L 11" apparently returning from a raid on England came down in a damaged condition near Hanover. The ground was immediately railed off, while the airship, which, it is said, showed signs of numerous hits, was dismantled. Messages from Amsterdam on August 3rd stated that several Zeppelins passed over Holland apparently going to Germany, and the "L 2" and "L 11" were fired at by Dutch guards. A message from Geneva on August 3rd stated that two airships, one badly damaged, the other apparently undamaged, were reported to have arrived early that morning at Friedrichshafen.

Raids, Past and to Come, on England.

As was not unexpected, the recent Zeppelin visits to England have led to the appearance of several fantastic stories in Germany. Thus regarding the raid on August 2nd, the following semi-official statement was sent out from Berlin on the 5th inst. :—

"At Harwich the naval forces in the harbour were twice attacked, and the docks and railway works were abundantly bombarded. In the county of Norfolk industrial buildings and searchlight installations before Norwich and Winderston (?) were successfully attacked. Then Lowestoft was attacked, where a number of fires broke out in factories.

"On the way, when over Hoofden (?), an enemy seaplane suddenly appeared from the clouds and three times attempted to attack one of our naval airships, but each time the enemy aeroplane was obliged to retreat before our machine gun fire, and it finally disappeared westwards. Before Yarmouth one of our airships encountered a British seaplane, which was also forced to retire."

Another specimen was the following anonymous cable to the New York *World* sent out from Berlin on August 4th :—

"The third great aerial attack on England by a fleet of Zeppelins has been made within seven days. It took place last (Wednesday) night. A laconic official *communiqué* will probably be issued this afternoon. The Zeppelin fleet included two new Zeppelin giants, which are the last word in Germany's aerial cruisers, of the type to come, when a peaceful trans-ocean service will be carried on, by means of which Count Zeppelin hopes to link Germany with America in another bond in the air, as the "Deutschland" has done under the sea.

"Military reasons forbid details of the new Zeppelins, but I am able to say that they are of gigantic size, have a tremendous radius of action, and are of comparatively enormous carrying capacity. They have great speed and wind-sucking power, and are capable of flying at a great height. On this last trip they carried an enormous quantity of shells. Some idea of the power of their motors and their speed may be gathered from the fact that one of them returning from England covered a distance of 380 kilometres (237½ miles) in two hours—this, of course, with a favourable wind."

The palm, however, for magnificent lying must be given to the "telegram" sent out by the German Telegraphic Union, dated Flushing, August 2nd. Although no boat had arrived in Flushing for three days the "telegram" stated that a Dutch engineer who spent the night of July 31st-August 1st in a London suburb, witnessed the German airship attack. He is said to have been a guest of the Anglo-Dutch Rowing Club and passed the night with his friends in a boathouse on the Thames. The damage done was, he says, so serious that it is at present impossible to estimate it. Several warehouses were destroyed, and ships at anchor were seriously damaged. The excitement of the London population was indescribable. He adds that a whole quarter of Huntingdon was burnt out, and the loss of human life in Kent was especially great.

Zeppelin Raid on Finland.

A TELEGRAM from Sundsvall to the *Stockholm Tidning* states that Zeppelins have dropped bombs on Sveaborg, a little island off Helsingfors, Finland, and on other fortifications in Finland. Although exact details of the damage done are not available, it is stated that it was small.

Zeppelins and Dutch Ships.

IN drawing the attention of the German Government to the fact that on July 7th a German airship, the L9, while passing close to the schooner "Weldaad," dropped some bombs which were obviously intended to hit the vessel, the Dutch Minister in Berlin, Baron Gevers, has requested the Government to issue such orders as will prevent the repetition of similar attacks on Dutch vessels. But something more than "requests" will be necessary to ensure even the most minute semblance of decent behaviour on the part of the German barbarians.

Rome and Zeppelin Raids.

THE *Morning Post* correspondent in Rome, writing on July 27th regarding the question of Italy declaring war on Germany, states that an expert says that the only military difference would be occasional Zeppelin raids, but that Rome would be bombarded none need believe, for the presence of the Pope, whom Germany durst not offend, would act as a "lightning conductor" against aerial raids. A German bomb on St. Peter's would be worse than a great military defeat for Germany.

Under Two Flags.

CURIOUS anomalies occur in war-time. Thus the *Nieuwe Rotterdamsche Courant* records that on July 27th a German medical officer who had deserted arrived in Gennep. His story was that his father and mother and his wife and children lived in France, where he himself had served as an airman in the Legion Etrangere, but as he was of German origin he was expelled at the beginning of the war. He said he could not conform to the German service regulations, and complained of insufficient food.

Aeroplanes and Artillery Spotting.

WRITING in the *Sunday Times* of Sunday last regarding the value of Pozières, Col. F. N. Maude, in explaining the value of the ridge which has been captured, says :—

"Indeed, the chances were against us, for a forward observation station can actually give the range and target more accurately to the guns behind it than the best of flying men trying to see through the dust and smoke churned up by our own shells on a dry but hazy day. Now, however, the break of the slope is in our hands—and our forward observing stations can see under the dust cloud when our airmen cannot see vertically through it—whereas the Germans have lost their advantage both ways. The reason is that both the ballistic power of the charge and the resistance of the air are always subject to deviation due to barometric pressure, moisture and so forth."

The Balkan Aerial Express.

ALTHOUGH, according to the *Neue Freie Presse* of Vienna the German scheme for a Balkan aerial express is nearing realisation, it goes on to say that a meeting is shortly to be held in Budapest to discuss the nature of the capital to be raised, the types of aircraft, the landing places, and the extent of the participation of the postal authorities of the three countries. The only thing settled appears to be the course from Berlin *via* Vienna and Budapest to Constantinople. The scheme is under the auspices of the Austrian Lloyd, the Hungarian Banking and Trade Co., and the German Surveying Co.

Frightfulness at Sea.

THE Helsingoer *Avis*, gives the following amusing story of two German seaplanes, which, while on patrol duty over the sea to the north of Kullen, observed the Swedish barque "Zusanne," bound for England with a cargo of pit props. In their hurry to descend and seize the vessel the seaplanes came into collision with one another and were so much damaged that they had to implore the captain of the "Zusanne" to tow them into Swedish territorial waters, which he agreed to do.

The curious procession was observed from Varberg by a Swedish patrol boat which immediately went out, but the Germans, on spotting this, managed to turn and escape into international waters, shortly after which an armed German trawler appeared on the scene and towed them southwards.

The Life and Work of Wilbur Wright.

The July–September number of the *Aeronautical Journal* is one which makes a wider appeal than the usual issue, as it is almost entirely taken up with the Wilbur Wright Memorial Lecture delivered by Mr. Griffith Brewer on June 6th. This, it will be remembered, dealt with the life and work of the late Wilbur Wright, and the able way in which Mr. Brewer dealt with the splendidly interesting subject makes a record which should be carefully preserved for reference and guidance. The lecture is printed complete together with all the appendices and a number of illustrations beautifully reproduced on art paper. Non-members of the Aeronautical Society may obtain copies of the complete lecture for 1*s.* 6*d.* net.

Testing the Thomas Motor.

The first of a batch of 135 h.p. Thomas aeromotors for the U.S. Navy was recently given a continuous eight-hour full load test before Naval Inspector Charles Cresswell, now stationed at the Thomas plant at Ithaca. In speaking of the test, Mr. Cresswell says: "The Thomas motor successfully passed its continuous eight-hour full load run. The motor ran 2,050 revolutions throughout the test and was noticeably free from vibration."

We understand that the horse-power developed was 141 at the propeller shaft, turning 1,230 r.p.m., showing that these motors are conservatively rated. The fuel consumption amounted to 12·5 gallons per hour, and the oil consumption 1·6 gallons per hour. One point about the motor which drew forth favourable comment was the absence of leaking oil.

It will be remembered that the Thomas aeromotor is fitted with a self-starter as regular equipment. This instrument, a Christensen combination air and petrol starter, selected by the Thomas engineers only after the most exhaustive trials, demonstrated its value by the ease with which the motor was started on this test.

The "Burfron" Weatherproof.

Ever striving to improve its already unique series of garments for use in all sorts of weather the famous house of Burberrys of Haymarket have evolved "something entirely new in weatherproofs." Their latest invention—known as the "Burfron"—is so entirely different to anything worn that every aviator should see it before settling on his new equipment for defying weather, and especially wet weather. To the casual observer the "Burfron" weatherproof appears to have no way of getting into or out of it; there it is on the person without visible buttons, fastenings or openings. A very smart and becoming top-coat, creating a confident impression, that we have here a safeguard that will absolutely defy the weather in its wildest moods.

"The Burfron."

Those who are unable to get to town and make a personal visit to the showrooms in the Haymarket should write to Burberrys for a copy of their booklet, "The Burfron: its many uses and advantages."

Carbide of Calcium.

In view of the increasing use of the oxy-acetylene system of welding in connection with aircraft work, there must be many who will want to have something more than superficial knowledge about carbide of calcium. Although the book which Mr. Charles Bingham has written is mainly concerned with the manufacture of the material, he naturally has much to say about the material itself, and this should prove exceedingly useful to those who are trying to use acetylene gas to the best advantage. The book is, we believe, the only one dealing with the subject in anything like an adequate manner, and Mr. Bingham's volume should at once take its place as an authoritative work. It is well illustrated and strongly bound in cloth. It is published by Raggett and Co., and costs post free 5*s.* 6*d.*

A British Raid Victim in Russia.

One of the motor ambulance columns which have recently been the target of German bomb-dropping aeroplanes was that attached to the Anglo-Russian hospital. The column was stationary at the time in a wood, and among the casualties was a British mechanic, who was wounded in the hip.

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IMPORTS AND EXPORTS, 1915-1916.

Aeroplanes, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "Flight" for January 25th, 1912; for 1912 and 1913, see "Flight" for January 17th, 1914; for 1914, see "Flight" for January 15th, 1915; and for 1915, see "Flight" for January 13th, 1916:—

	Imports.		Exports.		Re-Exportation.	
	1915.	1916.	1915.	1916.	1915.	1916.
	£	£	£	£	£	£
January ...	20,382	1,509	435	6,399	13,706	—
February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	59,287	2,400	—
July ...	1,240	2,072	13,372	12,932	—	—
	30,118	23,768	61,409	166,956	48,544	4,090

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Aeronautical Patents Published.

Applied for in 1915.

Published July 27th, 1916.

12,375. S. Utin and — Pappadakis. Flying machine.
14,603. W. Lawson. Aeronautical machines.

Published August 3rd, 1916.

5,330. Edgar Allen and Co. and Shaw. Apparatus for exposing, developing and finishing photographic films on aeroplanes, airships, or other aircraft.
9,719. J. L. Garsed. Controlling and operating planes, wings, rudders, &c., of flying machines.
9,987. W. R. Hallett. Aeroplanes, &c.
10,144. F. A. Dugro. Means for detaching bombs, &c., from flying machines and attaching them to other objects.
10,152. R. A. Holbech. Propeller.

Published August 10th, 1916.

9,045. W. H. Nosworthy and S. J. Prescott. Aerial propellers.
10,377. Sperry Gyroscope Co. Automatic means for stabilising aircraft.
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TO OUR READERS.

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THE PUBLISHERS.

EDITORIAL COMMENT.

WE proposed to publish in this issue the very much curtailed report of the Advisory Committee for Aeronautics for the year 1915–16. Want of space, however, has compelled us to hold it over until next week. In the meantime we would say that it contains little that was not already mentioned in the Report of the National Physical Laboratory, which we published in our issue of July 20th, when we commented upon the work done by that valuable institution, to as great an extent as is permissible

Air Research. under existing conditions. Special attention may, however, be called to some of the experiments mentioned in the report of the Advisory Committee. For instance, the knowledge of the exact numerical relation between the full scale and model coefficients has been considerably increased by experiments in the wind channels of the range of values of vl/v, which should greatly help towards the ability to predict with a fair degree of exactitude the performance of full-sized machines from model figures.

In regard to the factor of safety of six called for by the authorities, it has been found desirable in some cases to employ a lower factor in order to obtain "safety of a different kind," as, for instance, we presume, ability to quickly climb out of the range of anti-aircraft guns. It is stated in the report that instruction and information as to the calculation of strength, which demands still greater precision with the lower factor of safety, has been freely given to constructors and designers. In this connection it might be pointed out that there have been built machines by private firms that possessed the "factor of safety of a different kind," but the performance of which was greatly hampered, not to say spoilt, by official insistence on a higher theoretical factor of safety, although no case is on record of any of these machines ever breaking in the air even before being strengthened to comply with official requirements. However, it is now apparently officially recognised that a machine with a factor of safety of say, three, capable of climbing out of gun range, may actually be safer than one possessing the required factor of safety of six, but being too heavy to reach a reasonably safe altitude in the time disposable.

Although not occurring together in the report, and *possibly* having no connection, there are two remarks which appear to indicate investigations of the greatest importance. One is to the effect that two new devices are being tested for improving the performance at heights, and the other states that special tests have been made on the use of air-screws of variable pitch. The importance of developments in this direction can scarcely be exaggerated. It will be obvious to anyone having the slightest knowledge of the fundamental principles of aviation that if means can be devised for enabling an aero engine to develop its full power at great altitudes, a step will have been made in the right direction, since this is equivalent to saying that the aeroplane will be capable of travelling considerably faster owing to the less density of the air at altitudes. It is equally evident that if full advantage is to be taken of the capability on the part of the engine to maintain its power some form of variable pitch propeller will have to be evolved. It is therefore highly gratifying to find that this important problem is receiving the attention of the authorities. The remainder of the contents of the Report does not, we think, call for any particular comment.

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Counsels of Perfection.

Once again the fetish has been raised of forbidding, by mutual agreement of the nations of the world, the use of aircraft after the present war has run its weary allotted span. This time the pleading note is sounded in quite a new—and unexpected—quarter. It comes from so sound a thinker and writer as Mr. H. F. Prevost Battersby, whose graphic pen pictures from out yonder are, or should be, well in the mind of "FLIGHT" readers. None the more the plea is just as impossible of realisation as if it came through the usual crank channels. As well, as of old, propose to push the waves of the sea back as imagine that so far-reaching and so fascinating a problem as the subjugation of the element of the air to man's will, is to be stayed at the instigation of any section of the world's peoples. Without question there can hardly be an individual in this sphere of ours, after the awful happenings of the past two years, but would gladly subscribe to any formula that would once and for all time abolish wars from amongst future generations' earnings. But to bring such an ideal state of things into being is now as ever an impossibility. It is not in the remotest sense of the word even an improbability. It is and will remain an impossibility. The task which any reformer in this direction must first set himself to attain is to alter human nature, and when he has accomplished this little variation of the laws of evolution, those remaining in the world may begin to believe that at last there may be reality in the dream which century after century in different forms has passed through the minds of so many men—great ones as well as mere cranks—the dawn of the day of eternal worldly peace. For ourselves we have not so imbibed the kultured teachings in this war of the Germanic barbarians as to engender any confidence in their respecting laws and agreements, whether they be of God or man, as to justify the rest of the world laying aside the only "peaceful" weapon of any consequence to them—the peaceful implement of might, superior and unassailable. Nothing except absolute domination of their brute-beast nature can or ever will appeal to the German blood-saturated criminals, and it is only by restraining power wielded with the most insistent and unyielding impartiality that will earn the respect of these self-convicted ruffians. Nothing in the world would give the Huns greater joy than to see such an idyllic state of affairs promulgated. They would, in their shocking hypocrisy, be the first to rejoice in God's great goodness in thus ensuring peace and goodwill for future generations—and before they had well gotten outside the precincts of the Peace Court forthwith plan and work to but one end, the building up in cunning secrecy of a fleet of aircraft so great and irresistible as to, in a not far distant period of the world's history, win them back not only all they have lost, and are to lose, through the letting loose by them of the war dogs of rapine and devastation, but they would secure such initial advantage as to probably make the rest of the world's task to once again right civilisation, an even more hideous undertaking than the holocaust of the present world's crime. No; to ensure to the world in the years to come an honourable peace, the world's rulers must be in the position to promptly punish any attempt at the violation of the canons of civilised nations. To that end it is not only imperative that the power and means of "policing" efficiently the criminally inclined classes of different nationalities should be in the hands of well-tried representatives of the Races of the World, but that those means should be physically unchallengable. A world's court of justice, with the right to condemn without the power to see that its sentence is carried out, would be about on a par with the Germans' ideas of smashing up and neutralising the British blockade of the Central Empires, by navigating one of their *Untersee* "merchantmen" over to America and back. Our only option after the war is to see that we are as strong in the air as we are at sea, and with proper provision and security for firmly chaining the mad dog of Europe down to his kennel for a century at least, there are just the germs of a possibility that the worst rabidness of the bloodthirsty Prussian maniacs may thereby be sufficiently subdued as to make it possible for their being readmitted to a seat at the council of the world's civilisation. The more awful the instrument by which such a peace for future generations is ensured the more certain is it that that instrument will be effective in attaining its object. Therefore shall we look to the development of the air element as the ultimate saviour of the world from a repetition of the ghastly nightmare which has afflicted the major portion of the inhabitants of this globe for a hundred weeks and more.

Exhibitions in New York and Chicago.

An Aircraft and Aero-motor exposition and trade congress is to be held in the Grand Central Palace, New York, from Sept. 10th to 16th inclusive. The exhibition, as well as one which it is proposed to hold at Chicago in December, will be conducted under the auspices of the National Aircraft and Motor Manufacturers' Association, which is in process of formation.

An Aerial Reserve for America.

Representations at Washington by the Aero Club of America appear to be arousing the interest of President Wilson and the Secretary for War in aviation. To supply the *personnel* for the increased air service demanded the President has signed an order authorising the formation of an Officers' Reserve Corps and an Enlisted Men's Reserve Corps. Details of the scheme have not yet been published.

" DOING SOMETHING FOR MOTHER."—Mr. Sykes on the Martinsyde making a heavily banked turn over the trees at Hanworth Park on " Mothers' Day."

The British Air Services

" PER ARDUA AD ASTRA "

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of August 8th :—

Temporary Lieutenant (R.N.V.R.) : H. Jullerot, entered as Fleet-Lieutenant (Temporary), seniority August 4th, and appointed to " President," additional, for R.N.A.S. Temporary commissions as Sub-Lieutenant (R.N.V.R.) have been granted to Temporary Warrant Telegraphist E. W. Sharp (R.N.R.) and A. D. Macdonald, seniority respectively of August 5th and 7th, and both appointed to " President," for R.N.A.S.

The following appeared among the Admiralty announcements of August 10th :—

The following have been entered as Probationary Flight-Sub-Lieutenants (Temporary), seniority, August 13th : T. K. Thyne, R. H. Daly, E. Huggan, N. M. S. Russell, A. J. B. Tonks, W. G. Little, F. H. Hudson, E. J. Land, and T. C. Pattinson.

The following appeared among the Admiralty announcements of Aug. 11th :—

Temporary Sub-Lieutenant (R.N.V.R.).—W. M. Smith, entered as Probationary Flight Sub-Lieutenant (Temporary), seniority Aug. 10th.

The following appeared among the Admiralty announcements of Aug. 14th :—

The following have been entered as probationary Flight Sub-Lieutenants (Temporary), seniority Aug. 6th, and all appointed to President, additional, for Royal Naval Air Service : C. E. Martin, N. C. Harrison, G. Andrews, E. C. Hilleby, L. C. J. Barlow, A. R. Stack, P. Johnson, and L. J. N. Mackay. Temporary commissions (Royal Naval Volunteer Reserve) have been granted to the undermentioned, with seniority as follows : Lieutenants—W. N. Goldsmith and W. J. Fernie, Aug. 12th ; Sub-Lieutenants—C. F. Yeomans (Chief Petty Officer), Aug. 10th ; C. D. Butler and C. G. Ashton, Aug. 12th.

Royal Flying Corps (M.W.).

THE following appeared in the *London Gazette* of August 8th :—

Equipment Officers (from Assistant Equipment Officers, and to be Temporary Captains whilst so employed).—July 1st, 1916 : Temporary Lieut. G. L. Wightman, General List ; Lieut. G. S. Peacock, Special Reserve. Temporary Lieut. A. R. Earle, General List ; July 15th, 1916. Second Lieut. E. S. Perrin, Special Reserve ; July 20th, 1916. Temporary Lieut. A. M. C. Scott, Lond. R. (T.F.) ; July 25th, 1916.

Flying Officers.—Second Lieut. E. L. Lewis, Essex R. (T.F.) ; June 19th, 1916. Temporary Lieut. W. Stobart, Durh. L.I., and to be transferred to the General List ; June 23rd, 1916. June 28th, 1916 : Temporary Capt. J. C. M. Hay, Motor Machine Gun Serv., and to be transferred to the General List ; Capt. G. W. D. Allen, L'pool R., Special Reserve, and to be seconded. Lieut. G. H. Bowerman, R. War. R., Special Reserve, and to be seconded ; June 29th, 1916. June 30th, 1916 : Lieut. W. R. B. Gifford, Middx. R., Special Reserve, and to be seconded. Lieut. J. W. Yuile, Canadian General List. Temporary Second Lieut. C. H. B. Readman, Durh. L.I., and to be transferred to the General List. July 12th, 1916 : Second Lieut. R. P. Atwood, Special Reserve ; Temporary Second Lieut. W. H. Longton, General List. Lieut. (Temporary Capt.) E. A. Beaulah, Linc. R. (T.F.) ; July 13th, 1916. July 14th, 1916 : Second Lieut. (on probation) O. W. Morgan, R.F.A., Special Reserve. Second Lieut. P. Thompson, Special Reserve ; Second Lieut. E. J. Henderson, Special Reserve. July 15th, 1916 : Temporary Capt. H. J. Petty, Welsh R., and to be transferred to the General List ; Temporary Second Lieut. W. Hargreaves, General List, from a Flying Officer (Observer) ; Second Lieut. F. D. Holder, E. Kent R., and to be seconded ; Second Lieut. H. Hulbert, Special Reserve ; Second Lieut. H. V. Puckridge, Shrops. L.I., and to be seconded ; Second Lieut. A. P. M. Sanders, North'd. Fus., and to be seconded ; Second Lieut. N. Cooper, Special Reserve ; Second Lieut. H. A. Rigby, Special Reserve. July 16th, 1916 : Capt. R. E. Wilson, Hamps. R., Special Reserve, and to be seconded ; Temporary Second Lieut. H. C. Mulock, S. Staff. R., and to be transferred to the General List ; Second Lieut. K. C. McCallum, Arg. and Suth'd. Highrs., Special Reserve, and to be seconded ; Second Lieut. C. Holland, Special Reserve ; Second Lieut. F. E. Sargood, Special Reserve ; Second Lieut. W. K. M. Britton, R. Muns. Fus., and to be seconded ; Second Lieut. C. E. Finlay, Special Reserve ; Second Lieut. J. T. Hanning, Special Reserve ; Temporary Second Lieut. H. J. Larkin, General List ; Second Lieut. W. F. Williamson, Special Reserve.

Balloon Officer.—Capt. H. M. Meyler, Bord. R., from Adjutant ; June 26th, 1916.

Assistant Equipment Officers.—July 10th, 1916 : Temporary Second Lieut. E. J. Street, General List ; Temporary Second Lieut. H. Jones, General List ; Temporary Second Lieut. J. H. Winch, General List. Second Lieut. F. Ashforth, Special Reserve ; July 12th, 1916. Temporary Second Lieut. S. G. Young, General List ; July 17th, 1916. Second Lieut. S. Clark, Special Reserve ; July 19th, 1916. Temporary Second Lieut. S. E. H. Orde, Durh. L.I., and to be transferred to the General List ; July 21st, 1916. July 24th, 1916 : Temporary Second Lieut. D. Blairman, North'n. R., and to be transferred to the General List ; Second Lieut. E. F. Warner, Home Counties Divl. Cyclist Co. (T.F.) ; Second Lieut. L. F. Peaty, Special Reserve ; Temporary Second Lieut. N. K. Johnson, General List ; Second Lieuts., Special Reserve, A. B. Albert, T. E. H. Bristow, A. L. Cockburn, F. H. Jones, A. Young.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank : M. M. Sisley, S. W. Carline, R. H. Edwards, S. Clark.

The following appeared in a supplement to the *London Gazette* issued on August 9th :—

Temporary Appointments made at the War Office.

A.A.G.—Brevet Lieut.-Col. F. H. Sykes, C.M.G., 15th Hrs., from an A.A. and Q.M.G. ; June 9th, 1916.

Establishments.

Staff Officer, 3rd Class (graded for purposes of pay as a Staff Captain).—Second Lieut. T. M. Eggar, Lond. R. (T.F.), and to be Temporary Captain whilst so employed ; July 7th, 1916.

Squadron Commander.—Second Lieut. (Temporary Capt.) L. Parker, 15th Hrs., from a Flight-Commander, and to be Temporary Major whilst so employed ; July 1st, 1916.

Flight-Commanders (from Flying Officers, and to be Temporary Captains whilst so employed).—Lieut. C. J. Hart, Worc. R., Special Reserve ; July 16th, 1916. July 21st, 1916 : Lieut. J. H. Simpson, Special Reserve ; Second Lieut. R. H. G. Neville, D. of Corn. L.I.

Flying Officer.—Temporary Second Lieut. R. G. Fraser, General List ; July 5th, 1916.

Flying Officers (Observers).—Lieut. G. A. R. Spain, 103rd Mahratta L.I., Ind. Army ; Dec. 1st, 1915. Lieut. (Temporary Capt.) J. O. C. Orton, Norf. R., and to be seconded ; Jan. 1st, 1916. Jan. 10th, 1916 : Capt. J. W. Thomson-Glover, 35th Sikhs, Ind. Army ; Lieut. T. M. Dickinson, 16th Cav., Ind. Army ; Lieut. J. Mitchell, R.A., and to be seconded ; March 15th, 1916. Lieut. C. T. Sanctuary, R.F.A. (T.F.) ; April 1st, 1916. July 26th, 1916 : Capt. F. H. Mardall, 41st Dogras, Ind. Army ; Capt. B. S. Lyon-Williams, Wilts. R., Special Reserve, and to be seconded ; Lieut. T. E. Withington, Oxf. and Bucks. L.I., and to be seconded ; Temporary Second Lieut. C. L. Blake, Army Cyclist Corps, and to be transferred to the General List ; Temporary Second Lieut. H. G. Bellamy, Worc. R., and to be transferred to the General List ; Second Lieut. L. G. H. Vernon, R. W. Fus., and to be seconded ; Temporary Second Lieut. J. A. Turnbull, General List ; Lieut. C. B. Wainwright, R.A., and to be seconded ; Temporary Second Lieut.

C. G. Holman, Army Cyclist Corps, and to be transferred to the General List; Temporary Second Lieut. G. R. Simpson, R.A., and to be transferred to the General List; Temporary Second Lieut. A. Broomer, R. Lanc. R., and to be transferred to the General List; Temporary Second Lieut. F. H. Bickerton, Machine Gun Corps, and to be transferred to the General List.

Memoranda.—Warrant N.C.Os. and men to be Temporary Second Lieutenants (on probation) for duty with the R.F.C.—July 12th, 1916: Flight-Sergt. H. L. Woolveridge, from R.F.C.; Pte. S. A. Gibbons, from A.S.C. July 13th, 1916: L.-Corpl. G. Allen, from Surrey Yeo. (T.F.); L.-Corpl. A. J. Cathie, from A.S.C. Acting Sergt.-Major H. McKenna, from R.F.C.; July 15th, 1916. July 20th, 1916: Corpl. K. E. Tulloch, from R.E.; Corpl. G. K. Weisford, from R.E.

To be Temporary Second Lieutenants: Sergt. A. D. Goodwin, from R.F.C., for duty with the Military Wing of that Corps; July 15th, 1916. Lieut. A. G. T. Applin, from R.N.V.R., for duty with R.F.C.; July 17th, 1916.

The following appeared in a supplement to the *London Gazette* issued on Aug. 10th:—

Flying Officer.—Temporary Second Lieut. J. R. Herbert, General List, relinquishes his appointment on ceasing to be employed; June 26th, 1916.

Appointments made: Flying Officers (Observers).—Temporary Second Lieut. C. Pilkington, Shrops. L.I.; July 15th, 1916. July 16th, 1916: Lieut. F. J. H. Manville, 28th Canadian Inf. Bn.; Lieut. F. R. G. Milton, R.A., and to be seconded. July 17th, 1916: Temporary Lieut. J. C. Jervis, R. Fus., and to be transferred to the General List; Temporary Second Lieut. (Temporary Lieutenant) G. L. Sly, Yorks. L.I., and to be transferred to the General List; Temporary Second Lieut. T. H. Trew, York and Lanc. R., and to be transferred to the General List. July 19th, 1916: Lieut. T. R. Duff, Arg. and Suthd. Highrs., Special Reserve, and to be seconded; Temporary Second Lieut. H. Cockerell, General List; Lieut. H. H. Whitehead, 31st Canadian Inf. Bn.; July 20th, 1916. Second Lieut. A. G. C. Dann, N. Lan. R. (T.F.), from Machine Gun Corps; July 25th, 1916.

Memoranda.—Temporary Second Lieutenants, transferred to the General List, and to be Temporary Lieutenants whilst employed with R.F.C.:—June 1st, 1916: E. B. A. Rayner, E. Kent R.; W. T. Blake, Oxf. and Bucks L.I.; J. G. Will, Leins. R. July 1st, 1916: G. B. A. Baker, R. Berks. R.; W. A. W. Hallam, A.S.C.; G. B. Crole, R.A.F.; R. Bell-Irving, R.E.; H. A. V. Hill, A.S.C.; D. M. Deighton, A.S.C.

Second Lieutenants to be Temporary Lieutenants whilst employed with R.F.C.:—June 1st, 1916: R. C. L. Holme, Som. L.I.; W. H. Day, Hamps. R.; I. H. D. Henderson, Arg. and Suthd. Highrs.; M. G. Begg, Rif. Brig.; L. Moss, A.S.C.; J. E. Evans, R.W. Fus.; M. Jacks, E. Lan. R.; D. O. Mulholland, Conn. Rang., Special Reserve; C. E. M. Pickthorn, A.S.C., Special Reserve; F. A. Hunter, R.F.A., Special Reserve; T. S. Roadley, S. Staff. R., Special Reserve, July 1st, 1916: A. T. Rickards, R.G.A.; G. C. Levick, K.R. Rif. C.; A. L. Neale, Linc. R.

Temporary Second Lieutenants, to be Temporary Lieutenants whilst employed with R.F.C.:—June 1st, 1916: N. B. Fuller, J. Sowrey, A. D. Broughton, F. G. Saunders, L. G. Paget, W. Bailie, H. T. Horsfield, A. T. Wynyard-Wright, J. A. Barton, G. S. Inglis, H. F. Bradley, H. N. Charles, I. G. Davies, G. M. Goode, O. J. F. Scholte, A. W. Keen, E. J. Howard. July 1st, 1916: O. L. Owen, G. A. N. Mitchell, R. Fus.; C. Pilkington, Shrop. L.I.

Second Lieutenants (on Probation), Special Reserve, to be Temporary Lieutenants whilst employed with R.F.C.:—L. Walmsley, E. Yorks. R., and to be seconded; June 1st, 1916. July 1st, 1916: H. R. Jaques, S. Staffs. R.; D. M. Tidmarsh, R. Ir. Regt.; W. T. Coles, Oxf. and Bucks. L.I.; W. J. Shields, Essex R.; R. D. Vavasour, R.F.A.

(Official photo. issued by the Press Bureau.)

Anti-aircraft guns busy on a Hun plane during the British push in the West.

Second Lieutenants, Special Reserve, to be Temporary Lieutenants whilst serving with R.F.C.:—July 1st, 1916: G. H. B. Streatfeild, Durh. L.I.; J. E. Burt, Midd'x. R.; D. D. G. Hall, York. R.

Second Class Air-Mechanic Allan MacKay, from R.F.C., to be Temporary Second Lieutenant for duty with the Mil. Wing of the Corps; July 15th, 1916.

To be Temporary Second Lieutenants for duty with R.F.C.:—Cadet James G. Vecqueray, from No. 2 Officer Cadet Bn., Pembroke Coll.; July 8th, 1916. Private Arthur G. Cox, from Inns of Court O.T.C.; July 18th, 1916. Second Class Air-Mechanic P. M. H. Currie, from Hampshire Aircraft Park (T.F.); July 20th, 1916. Aug. 5th, 1916: Pte. R. T. Whitney, from Liverpool R.; Corpl. E. R. Pennell, from H.A.C. (T.F.); Sergt. H. H. Maddocks, from Berkhamsted Sch. O.T.C.; Corpl. G. R. G. Smeddie, from Loretto Sch. O.T.C.; L.-Corpl. H. C. Duxbury, from Merchant Taylors' Sch. O.T.C.; L.-Cpl. B. Mews, from Harrow Sch. O.T.C.; Cadet A. C. Sanderson, from Dulwich Coll. O.T.C.; Sergt. A. C. Tremellen, from Highgate Sch. O.T.C.; Co. Sergt.-Maj. E. P. Wykes, from Christ's Hosp. O.T.C.; L.-Corpl. Vaughan F. Williams, from Rugby Sch. O.T.C.; L.-Corpl. R. W. P. Goodwin, from Brighton Coll. O.T.C.; Corpl. D. C. H. MacBrayne, from Eton Coll. O.T.C.; Sergt. R. H. Ayre, from Leys Sch. O.T.C.; Pte. A. R. Harris, from Inns of Court O.T.C.; L.-Corpl. R. M. Marsh, from H.A.C. (T.F.); Corpl. A. E. P. Smith, from H.A.C. (T.F.); Pte. T. V. Villiers, from Inns of Court O.T.C.; Pte. Alexander B. Anstey, from Inns of Court O.T.C.; Sergt. M. C. Ellis, from Radley Coll. O.T.C.

Supplementary to Regular Corps.—The notification in the *Gazette* of June 22nd, 1916, regarding the appointment to a Second Lieutenancy of A. H. Smith is cancelled.

The Christian names of Second Lieut. (on probation) Henry Douglas Forbes Fraser are as now described, and not as in the *Gazette* of July 29th, 1916.

Second Lieutenants (on probation) confirmed in their rank: E. G. Manuel, R. E. Dangerfield, W. K. Trollope, W. Buckingham.

To be Second Lieutenants (on probation): A. W. Crombie; July 10th, 1916. C. S. Hickle; July 26th, 1916. J. M. Heesem; July 27th, 1916. Aug. 1st, 1916: Alfred E. Venables, P. G. Ashford, J. Smyth. J. G. Thompson, H. S. Jackson, F. C. Berkley, A. L. Constabel, H. Haycock, V. H. Adams, L. B. Clarkson, C. Musgrave, H. E. Martin, V. S. H. Abbott, D. N. Robertson, H. B. Begg, E. Christmas, E. B. Smyth, T. R. Field, W. J. Pike, G. N. B. Baynes, H. Blofeld. R. W. Jones, A. C. Young, J. C. Young, W. F. B. Broomhall, C. H. White, F. R. Lucas, W. L. Winstanley. Aug. 5th, 1916: L. H. Gibbon, J. E. Edgar, A. B. Davidson, H. C. Leigh, A. V. H. Gompertz, T. D. Bracken, G. S. Deane.

The following appeared in the *London Gazette* of Aug. 11th:—

Memorandum.—The undermentioned to be Temporary Second Lieutenant: Sapper A. Hutchison, from Clifton Coll. O.T.C., for duty with R.F.C.; Aug. 5th, 1916.

The following appeared in a supplement to the *London Gazette* issued on Aug. 12th:—

Flight-Commanders.—From Flying Officers, and to be Temporary Captains while so employed: Second Lieut. D. O. Mulholland, Conn. Rang., Special Reserve; July 25th, 1916. 2nd Lieut. J. Minôt, Special Reserve; July 28th, 1916. Temporary Lieut. D. Wilson, General List; July 29th, 1916. July 30th, 1916: Lieut. C. J. W. Darwin, C. Gds.; Temporary Second Lieut. K. N. Pearson, General List.

Memorandum.—Second Lieut. C. W. Short, Indian Army Reserve of Officers, to be Temporary Lieutenant whilst serving with R.F.C.; July 1st, 1916.

The following appeared in a supplement to the *London Gazette* issued on Aug. 14th:—

Wing Commander.—Capt. (Temporary Major) A. E. Borton, D.S.O., R. Highrs., from a Squadron Commander, and to be Temporary Lieutenant-Colonel whilst so employed; Aug. 1st, 1916.

Flying Officers.—Second Lieut. E. G. Manuel, Special Reserve; July 1st, 1916. Second Lieut. E. A. Lloyd, R.N., Devon Yeo. (T.F.); July 17th, 1916. Lieut. T. E. Blackater, R. Lanc. R., Special Reserve, and to be seconded; July 19th, 1916. July 20th, 1916: Second Lieut. (Temporary Lieut.) H. C. Naldrett, Essex R. (T.F.); Second Lieut. E. W. Capper, Montgomeryshire Yeo. (T.F.); Temporary Second Lieut. R. V. Franklin, R. Lanc. R., and to be transferred to the General List; Second Lieut. R. E. Dangerfield, Special Reserve; Second Lieut. C. N. Russell, Special Reserve. July 21st, 1916: Second Lieut. C. G. Shaumer, Lond. R. (T.F.); Second Lieut. A. Ball, R. Lanc. R., Special Reserve, and to be seconded. Second Lieut. W. K. Trollope, Special Reserve; Lieut. (Temporary Capt.) H. W. G. Jones, Welsh R. (T.F.); July 22nd, 1916. July 23rd, 1916: Second Lieut. G. L. Backhouse, Norf. R. (since deceased), and to be seconded; Second Lieut. W. Buckingham, Special Reserve; Second Lieutenant (Temporary Lieut.) A. R. Boeree, Suff. R., (T.F.); July 24th, 1916.

Assistant Equipment Officers.—Temporary Second Lieut. E. A. Gulson, General List; June 14th, 1916. Second Lieut. (Temporary Capt.) P. L. Hunting, North'd Fus. (T.F.); July 11th, 1916. Temporary Second Lieut. F. Petch, General List; July 12th, 1916.

Memoranda.—To be temporary Second Lieutenants for duty with R.F.C.:—Aug. 8th, 1916: Staff-Sergt. C. A. F. Rogers, from Lond. Field Amb. (T.F.); L.-Corpl. G. Carpenter, from A.S.C., M.T.; Cadet A. Travers, from Man. Univ. O.T.C.; L.-Corpl. R. N. Swann, from 6th Australian Light Horse; Pte. E. J. Smart, from Univ. of Lond. O.T.C.; Cadet F. S. Potts, from Artists Rif. O.T.C. From Inns of Court O.T.C.: Pte. G. N. Brockhurst, Pte. L. E. Vine, Pte. C. K. Tait, Pte. D. F. Cox, Pte. G. H. S. Cregeen, L.-Corpl. J. B. Hine, Pte. R. H. S. Hunter, Pte. D. S. C. Newton.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: R. T. Griffin, E. J. Smyth, H. S. Pell, E. M. Wright, G. J. Harter, E. S. T. Cole.

To be Second Lieutenants (on probation): C. Clarke; July 25th, 1916. Andrew C. Kiddie; Aug. 1st, 1916.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Injured (AUGUST 8TH).

Flight-Lieut. J. S. Mills, D.S.C., R.N.

(AUGUST 10TH).

Flight-Sub-Lieut. A. O. Brissenden, R.N.

Accidentally Injured (AUGUST 12TH).

Flight-Lieut. T. C. Vernon, R.N.

Slightly Injured (AUGUST 5TH).

Probationary Flight-Sub-Lieut. D. G. Donald, R.N.

Previously reported Missing, now Unofficially reported Prisoners of War in Germany.

Flight-Sub-Lieut. F. J. Bailey, R.N.
Sub-Lieut. F. W. Mardock, R.N.V.R.

The following casualties have been officially announced by the War Office:—

Killed.

Second Lieut. H. C. Davis, R. Berks R., attd. R.F.C.

Died of Wounds.

Lieut. M. T. Vaughan-Lewes, Welsh R., attd. R.F.C.

Previously reported Missing, now Unofficially reported Killed.

Second Lieut. C. Monckton, R. Irish Fus. and R.F.C.
Second Lieut. C. I. Sandys-Thomas, Royal Flying Corps.

Previously reported Missing, now reported Died of Wounds as a Prisoner of War.

Lieut. C. H. Coxe, Royal Flying Corps.

Died.

Second Class Air Mech. C. Bramall, 11646.
Second Class Air Mech. C. Brown, 18369.
Second Class Air Mech. P. Gorringe, 17399.
Second Class Air Mech. W. Smith, 3393, R.F.C.

Previously reported Missing, now reported by the German Government Killed or Died of Wounds.

First Class Air Mech. J. W. Newton, 3098, R.F.C.

Wounded.

Second Lieut. F. H. Bickerton, Machine Gun Corps, attd. R.F.C.

Second Lieut. J. B. Hinchcliffe, King's Own Yorks. L.I., attd. R.F.C.
Capt. P. A. Kirkup, Durham L.I., attd. R.F.C.
Second Lieut. E. H. Lascelles, K.R.R.C., attd. R.F.C.
Second Lieut. E. V. Maclean, R.F.A., attd. R.F.C.
Second Lieut. W. S. Mansell, E. Surrey R., attd. R.F.C.
Second Lieut. C. G. Riley, R. Fus., attd. R.F.C.
Second Lieut. R. H. M. S. Saundby, R. Warwick R., and Royal Flying Corps.
Second Lieut. S. Stretton, Royal Flying Corps.

Previously reported Missing, now reported Wounded.

Capt. W. D. S. Sanday, Royal Flying Corps.

Missing.

Second Lieut. L. L. Clark, R.H.A., attd. R.F.C.
Lieut. K. Mathewson, Royal Flying Corps.
Second Lieut. H. J. Newton, Cheshire R., attd. R.F.C.
Second Lieut. R. W. Nichol, Royal Flying Corps.
Lieut. J. A. N. Ormsby, Canadian Machine Gun Batt., attd. R.F.C.
Second Lieut. C. A. Ridley, R. Fus., attd. R.F.C.
Capt. C. W. Snook, Royal Flying Corps.
Capt. W. A. Summers, Hussars, attd. R.F.C.
Second Lieut. C. I. S. Thomas, Royal Flying Corps.
Lieut. M. W. Thomas, R.F.A., attd. R.F.C.
Second Lieut. J. C. Turner, R.F.A., attd. R.F.C.

Previously reported Missing, now reported Prisoners of War.

Second Lieut. R. W. Nichol, Royal Flying Corps.
Second Lieut. L. A. Wingfield, R. Fus., attd. R.F.C.

Previously reported Missing, now Unofficially reported Prisoners of War.

Second Lieut. W. F. L. Castle, Royal Flying Corps.
Capt. T. W. P. L. Chaloner, Yorks. R., and Royal Flying Corps.
Lieut. H. Clements-Finnerty, Lancers, Attd. R.F.C.
Second Lieut. J. W. Toone, R. Irish R. and R.F.C.
Second Lieut. C. I. Van Nostrand, Royal Flying Corps.

Corrections: **Missing.**

Second Lieut. R. M. W. Browne, R.F.C., should read :
Second Lieut. R. M. Wilson-Browne.
Second Lieut. A. H. T. L. Speer, R.F.A., attd. R.F.C., should read :
Lieut. A. H. T. L. Speer.

THE "X" AIRCRAFT RAIDS.

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief Home Forces :—

"X 42" Raid, August 9th. *"August 9th, 10.15 a.m.*

"Hostile airships crossed the East Coast of England in the early hours of the morning. Another airship is reported to have visited the South-East Coast of Scotland.

"The raiders did not penetrate far inland, but dropped a number of bombs in various localities near the coast.

"At several places the airships were engaged by anti-aircraft guns and driven off from their objective.

"Reports received up to the present show that three women and one child were killed, and 14 persons injured.

"No damage of military importance has been reported."

"4.10 p.m.

"The Eastern Coast of the United Kingdom was raided by hostile airships this morning between 12.30 a.m. and 2.30 a.m.

"The East and North-East Coast districts were visited by the raiders at widely distant points, more or less simultaneously.

"The attack was carried out by the enemy by single ships or by pairs of ships. Independent observations of the raiders estimate their numbers variously at between seven and ten.

"None of the airships ventured more than a few miles inland, except in the extreme North. The attack seems to have been solely directed against the towns situated on the coast. Indiscriminate destruction of property seems to have been the main object of the raid.

"Anti-aircraft guns came into action at four places, and seem to have been successful in nearly every case in driving off the raiders. One raider was pursued several miles to sea by one naval aeroplane.

"In view of the action of the guns and the apparent uncertainty of the movement of the airships, it is not surprising that the enemy failed to attain his end. The bombs mostly fell wide of any centre of population.

"An exception must be made in the case of one North-Eastern town, where the following casualties have now been reported :—

	Men.	Women.	Children.
Killed	—	2	3
Died of shock	1	—	—
Injured	4	5	3

"In another North-Eastern town one man, one woman and three boys were injured.

"The total damage amounts to four houses partly burnt; numerous windows broken in several different towns and villages; 50 ft. of railway torn up; one horse killed; some lesser insignificant damage. None of the damage is of the slightest military importance.

"About 100 high explosive and over sixty incendiary bombs have been traced. The enemy probably disposed of more bombs, as several were heard exploding on impact in the sea, and others fell on waste land. None of these have been included in the above figures."

"August 11th.

"Since the issue of the last *communiqué* of the 9th inst., regarding the hostile air raid of the preceding night, two of the injured have succumbed; the total number of deaths is, therefore, eight.

"Careful inquiries made in those districts from which detailed reports were not available on the 9th inst. have been made. These show that the total damage caused by the raid is slightly greater than at first stated.

"The total stands as follows :

"Four small houses wrecked.

"One shop demolished.

"Three dwelling houses and three shops damaged by explosion or fire.

"A number of small houses and cottages slightly damaged either by fragments of bombs or by concussion which shattered windows.

"Fifty feet of colliery railway line torn up.

"One horse killed.

"This is a complete list of all damage caused during this raid. None of it is of any military significance whatever."

German Version.

"Berlin, August 10th.

"Several German naval airship squadrons during the night of Aug. 8th–9th bombarded with explosive bombs of the heaviest calibre and incendiary bombs the naval bases on the English coast, and industrial establishments of military importance in the coastal counties from Northumberland to Norfolk. In the comparatively clear night excellent results could everywhere be clearly observed. Powerful explosions were observed at the iron works and benzol factories in Middlesbrough, and large fires were seen in the harbour establishments of Hull and Hartlepool. The good effects of the explosions were also observed in yards on the Tyne, and fires were caused in the industrial establishments of Whitby. Strong effects were seen at the railway establishments of King's Lynn. All our airships returned undamaged, in spite of the enemy's searchlights, anti-aircraft guns, and sea-fighting forces."

It is officially stated that this German report is the usual perversion of the truth.

"X 43" Raid, August 12th.

The following *communiqué* was issued by the Field-Marshal Commanding-in-Chief, Home Forces :—

"August 12th.

"Two hostile seaplanes appeared over Dover between 12.25 and 12.30 this afternoon. Four bombs were dropped, but no material damage was done beyond the breaking of a few windows.

"Anti-aircraft guns came into action and aeroplanes went up in pursuit of the raiders, who made off seawards at about 12.35.

"The casualties were one officer and six men slightly injured."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Club Premises.

Alteration of Rule 50.—At the Special General Meeting of the Members held on July 27th, 1916, it was unanimously resolved that Rule 50 be altered as follows:—

> "RULE 50.—For the year 1917 and thereafter the subscription for Members shall be £5 5*s.* 0*d.* per annum, and for Lady Members £2 2*s.* 0*d.* per annum, or such other sum as may be decided upon in General Meeting, and the entrance fee £2 2*s.* 0*d.*, or such other sum as the Committee may from time to time determine."

The Club will remove from its present premises at the end of September, and full particulars of the new Club House will be issued shortly.

THE FLYING SERVICES FUND
administered by
THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	*s.*	*d.*
Total subscriptions received to August 8th, 1916	10,807	0	10
Staff and Workers of Gwynnes, Ltd. (Twenty-first contribution)	8	7	9
Total, August 15th, 1916.. ..	10,815	8	7

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

THE LORD MAYOR ENTERTAINS SOME OF OUR WOUNDED.

WHAT might be described as a cerulean blue army overran the magnificent grounds of the Karsino at Hampton Court on Saturday last, when 1,000 wounded soldiers were the guests of the Lord Mayor, Sir Charles Wakefield, and were entertained to tea on the terraces. Despite the petrol difficulty, they were, owing to the kindly efforts of the A.A.V.S.C., the transport section of the Polytechnic V.T.C. and the L.G.O.C., with the assistance of many private owners, transported to the scene of activities by motor vehicle.

Entertainment of Wounded Soldiers by the Lord Mayor, Col. Sir Charles Wakefield.—Mr. Harry Hawker, on a Sopwith biplane, giving an exhibition of flying, including looping, at the Karsino, Hampton Court, on Saturday last.

On being ferried over to the island, each "Tommy" was presented with a packet of cigarettes, a box of matches, a programme, and a fine souvenir badge in coloured enamels and gold lettering, bearing the City coat of arms, and the wording:—"From the Lord Mayor, Col. Sir Charles Wakefield. Souvenir of August 12th, 1916." Ladies of the Wimbledon Swimming Club gave an exhibition of diving. There were cocoanut shies and "hoop-la," darts and pipe breaking, at the old village fair at the west end of the island.

During tea, Mr. Harry Hawker fulfilled his promise to fly over and give an exhibition of his skill on a Sopwith biplane. He arrived shortly before five, flying at a high altitude, and planing down to within a couple of hundred feet. Sheering off he again climbed to about two thousand, and returning gave a great display of vertical banking and looping the loop, finally disappearing in the direction of Brooklands. The cheers—real Wakefield cheers—could Hawker have heard them, were such as only "Tommy" can give.

"Fall in" was sounded shortly after six, and a motor ride home to their respective hospitals brought to a close a most enjoyable day. Sir Charles is to be sincerely congratulated on the success attending his efforts to make everyone feel absolutely at home, a faculty he has in abundance, coupled with pure-hearted goodwill.

A most enjoyable day was spent, and one not to be easily forgotten by those taking part in it.

FLYING AT HENDON.

A DECIDEDLY gusty wind prevailed at Hendon last Saturday afternoon, gusts of 40 m.p.h. being quite frequent up above. In consequence, therefore, it was not until late in the afternoon, when conditions calmed down somewhat, that passenger work on the 80 h.p. G.-W. three-seater biplane was possible, although there were many applications for flights. Previous to the passenger work, however, a large Curtiss tractor came out and climbed to a fairish altitude, where the strength of the wind was manifest by the behaviour of the machine. Marcus D. Manton, H. C. Biard, C. Pashley and J. S. B. Winter all took it in turns to take up the passengers on the G.-W. 'bus, and M. G. Smiles and W. T. Warren, jun., took several passengers on the new L. and P. tractor biplane, and also executed some loops. Shortly after 6 o'clock a sharp shower of rain gently but firmly put a stop to any further proceedings and drove the visitors home.

On Sunday it was as windy as ever, but in spite of this there was some good flying. This was practically a repetition of the previous day's proceedings, the G.-W. stud doing passenger work on the three-seater, and "Wee Willie Warren" looping and taking passengers on the L. and P. tractor,

Grahame-White School, Hendon.

EIGHTS with instructor last week: Messrs. Ballard, Donald, Drew, Goodheart, Jamie, Keymer, Mulville and Stevens. Circuits with instructor: Messrs. Cockell, Rodocanachi and Ward. Straights with instructor: Messrs. Alty, Duncan, Fisher, Hodgkinson, Lyles, Mills, Saunders, Shadwell, Soden, Zambournis and Ormerod. Mr. Cooper doing figures of eight alone. Certificates were taken by Messrs. Welinkar and Forster. *Brevet* tests A and B by Mr. Phillips.

Instructors: Mr. C. Grahame-White, Messrs. Manton, Winter, Pashley, Biard and Hale.

Beatty School, Hendon.

THE following pupils were out during last week: Messrs. Skeet, Gliksten, Mitchell, Rudd, Curry, Gadsden, Earl, Garlick, McPherson, Towson, Elliott, Austen, Turner, J. Squires, Bruce, White, de Wilde, Wood, and Owen.

The instructors were: Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett, the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes.

Certificates were taken during the week by Messrs. C. W. Skeet (on Caudron machine), G. McPherson and H. J. H. Garlick (on Beatty-Wright machine).

Hall School, Hendon.

PUPILS out last week:—With J. Laurence Hall: Messrs. J. Russell, Graham Davies, and Probationary Flight Sub-Lieut. Malden. With Cecil M. Hill: Messrs. Cordner, Orton, Cownie, Gudger, Rayne, Le Grice, and Lieut. Packman. With Fred J. Glegg: Messrs. Henley, Stampes, Mayer, Barton, Illingworth, Smith, and Lieut. Packman. With Stanley G. Cownie: Pupils rolling—Messrs. Course, Mayer, Yuill, Maude, Stampes, and Lieut. Packman.

Royal Aero Club Certificates taken by J. Russell, Graham Davies, S. G. Cownie, Le Grice Test A.

Hall (Government type) tractors in use.

London and Provincial School, Hendon.

PUPIL rolling last week: Mr. Davy. Doing straights: Messrs. Quayle, Mander, Lewis, Rogers, Randell, Dunnett, Birkin, Fox and Sellars. Circuits and eights: Monsieur J. Leman.

Instructors: Messrs. W. T. Warren, M. G. Smiles and W. T. Warren, Jun.

Three tractor biplanes in use.

Ruffy-Baumann School, Hendon.

SCHOOL out nearly every day last week. Pupils with instructors on 60 and 50: West (48 mins.), Hayes (36), Babington Smith (18), Trubridge (20), Carr (32), Holmes (44), and Fanshawe (1 hour 10 mins.). Pupils flying alone: West and Holmes.

Instructors: E. Baumann, F. Ruffy, A. Baumann, and A. Thomsen.

60 and 50 h.p. Ruffy-Baumann dual-control biplanes in use.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Davies, Constant, Lloyd Owen, Holland, Wilmott, Montgomery, Ross, and Wingfield.

Doing straights alone: Messrs. Brandon, Hammersley, Pritt, J. B. Smith, Fenn, Hinchliff, and Adamson. Doing half-circuits alone: Messrs. O. Wilson, J. Wilson, Daniel, and H. Smith. Mr. W. G. Little figures of eights and circuits alone.

Two 35's, 45, 60 h.p. Caudrons in use.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

* * *

An R.N.A.S. Officer's Bravery.

THE *London Gazette* of August 11th contained an announcement by the Admiralty that the King has been pleased to confer the decoration of the Albert Medal of the First Class on Lieut. Frederick Joseph Rutland, R.N. (Flight-Lieutenant, R.N.A.S.):—

"The following is the account given by the Admiralty of the services in respect of which the decoration has been conferred:

During the transhipment of the crew of His Majesty's ship "Warrior" to His Majesty's ship "Engadine" on the morning of June 1st, 1916, succeeding the naval battle off the coast of Jutland, one of the severely wounded, owing to the violent motion of the two ships, was accidentally dropped overboard from a stretcher and fell between the ships. As the ships were working most dangerously, the Commanding Officer of the "Warrior" had to forbid two of his officers from jumping overboard to the rescue of the wounded man, as he considered that it would mean their almost certain death. Before he could be observed, however, Lieut. Rutland, of His Majesty's ship "Engadine," went overboard from the forepart of that ship with a bowline and worked himself aft. He succeeded in putting the bowline around the wounded man and in getting him hauled on board, but it was then found that the man was dead, having been crushed between the two ships. Lieut. Rutland's escape from a similar fate was miraculous. His bravery is reported to have been magnificent."

Medals for the R.F.C.

IN the long list, published on August 12th, of names of non-commissioned officers and men, to whom His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field, appear the following:—

7959 Corpl. F. J. Jenkins, R.F.C.
6326 1st Class Air-Mechanic J. I. T. Jones, R.F.C.
8483 2nd Class Air-Mechanic F. A. V. Pattenden, R.F.C.

Wireless Telegraphists for the R.F.C.

THERE are still vacancies in the Royal Flying Corps for wireless operators. Applicants, who should be of good education, age from 19 to 22, can get full particulars as to training, &c., any morning at the Polytechnic, Regent Street, W.

Fatal Accidents.

Two lives were lost in an accident on August 10th. A machine piloted by Lieut. G. S. Rogers was flying at a height of 1,500 ft., when another machine hit and damaged the tail. Lieut. Rogers endeavoured to control his machine, but nose-dived to the ground. The pilot was instantly killed, and the passenger, Second Lieut. De Frece, died shortly after being picked up. The second machine made a safe descent.

A machine piloted by Sec. Lieut. Ivan Carryer, E. York Regt. and R.F.C., caught fire while flying on August 13th. In coming down the machine crashed into a building, and the pilot died three hours after admission to hospital.

New Recruits for the S.B.A.C.

THE following firms have recently been elected to membership of the Society of British Aircraft Constructors, Ltd. The previous lists of members were given in our issues of April 20th and June 8th last:—

Ordinary Members—Aster Engineering Co., Ltd., Gnome and Le Rhone Engine Co., Green Engine Co., Ltd., Eastbourne Aviation Co., Ltd., Gordon, Watney and Co., Ltd.

Associate Members—Aircraft Supplies Co., Ltd., Bowden Wire, Ltd., British Aeroplane and Varnish Co., Ltd., Venesta, Ltd.

R.F.C. INQUIRY COMMITTEE. INTERIM REPORT.

An interim report of the R.F.C. Inquiry Committee was issued on Tuesday night as a White Paper. We reproduce this in full below :—

The Committee appointed "to inquire into the administration and command of the Royal Flying Corps with particular reference to the charges made both in Parliament and elsewhere against the officials and officers responsible for that administration and command and to make any recommendations in relation thereto" make this interim report. In so doing, the Committee, apart from one general observation at the end of the report, deal only with the charge of criminal negligence made by Mr. Pemberton Billing against the administration and higher command. The Committee take this course because their final report must be delayed owing to the mass of evidence they have had before them, evidence given for the most part in a spirit of informed and genuine criticism pointing out alleged shortcomings and suggesting means for their future avoidance.

Mr. Pemberton Billing's charge of criminal negligence is one which readily separates itself from the criticisms referred to, depending as it does upon specific instances selected by Mr. Pemberton Billing in proof of his accusation. The charge, moreover, was made in Parliament. It caused a considerable amount of uneasiness, and as all the cases have been investigated into which Mr. Pemberton Billing desired the Committee to inquire, it seems advisable to present an interim report upon the charge so made without loss of time.

In order to make the report self-contained and the more easily intelligible, the precise words in which the charge of criminal negligence was made are here set out.

Speaking in the House of Commons on March 22nd last, Mr. Pemberton Billing is reported to have said of men of the Royal Flying Corps who had met their deaths in flying : "I do not want to touch a dramatic note this afternoon, but if I did I would suggest that quite a number of our gallant officers in the Royal Flying Corps have been rather murdered than killed." (See Official Report, Vol. 81, col. 244.) The Official Report is hereafter referred to under the more familiar title of Hansard.

Speaking again in the House on March 28th, Mr. Pemberton Billing is reported (Hansard, Vol. 81, col. 615) to have used these words : "I would like to suggest that it is extremely difficult, even in law, to draw a hard and fast line between murder and manslaughter or between manslaughter and an accident caused by criminal negligence. When this negligence is caused by the official folly of those in high places, coupled with entire ignorance of the technics (*sic*) which in this case can alone preserve human life, official folly becomes at any rate criminal negligence. When the death of a man ensues, the line between such official folly and murder is purely a matter for a man's conscience."

This extract is set out at length in order to make it clear that the charge of criminal negligence is levied against the administration and higher command of the Royal Flying Corps and not against the subordinate officers or pilots. When, therefore, in this report the question of negligence is considered and discussed, it must be understood that the Committee have in mind this question : Does the particular instance under consideration show negligence on the part of the higher command or the persons responsible for the administration of the service ?

In support of his allegation of criminal negligence Mr. Pemberton Billing gave to the House on the same March 28th a number of specific instances. (See Hansard, Vol. 81, col. 611, *et seq.*). When Mr. Pemberton Billing appeared before the Committee he was invited to give the instances into which he desired inquiry to be made, and to give the evidence upon which he relied. He informed the Committee that many of the cases mentioned by him in the House had occurred in the naval service, but he selected for investigation a number of cases in the Royal Flying Corps.

The Committee have inquired into every one of the cases so selected and deal with them *seriatim* in this report. This report sets out in every case the statement as it appears in Hansard, where the case is there mentioned. Then a summary of any further information given to the Committee by Mr. Pemberton Billing. Then the facts as found by the Committee, and, lastly, their conclusion. Where a case is numbered the number is that given by Mr. Pemberton Billing in his speech in the House.

It is only necessary to add that in no case has any direct evidence been given in support of any allegation of negligence. Mr. Pemberton Billing informed the Committee that the source of his information was the talk of the messroom or statements written or oral made to him by persons whose names he was not at liberty to disclose. The Committee appreciated the difficulty experienced by him and others in getting officers of the Royal Flying Corps to come forward publicly, and, in order to meet this objection, made arrangements to take their evidence in the absence of General Henderson and any of his staff, and in such a way as to prevent disclosure of their identity. These arrangements were communicated to Mr. Pemberton Billing, and it is to be regretted that, while certain officers availed themselves of the opportunity, none of Mr. Pemberton Billing's informants did so. Under these circumstances the Committee have followed up such information as Mr. Pemberton Billing could give them by their own enquiries and have obtained the best evidence available.

To proceed to the instances—(*a*) No. 2, Hansard. Vol. 81, col. 611. Side-slip, nose-dive ; bombs blew up everyone on board machine. Similar to that which killed two pilots previously. Liable to uncontrollable spirals.

Supplemental statement to the Committee.—Type of machine, B.E. 2.8. Date, 16 August, 1914. Place, Minster. Persons killed—Lieutenant E. W. C. Perry ; air mechanic, Parfitt.

Facts.—Mr. Perry flew over to Amiens on a B.E. 8 machine with the First Expeditionary Force. He with others landed at Amiens. He was one of the last to leave Amiens and was seen to start by Captain Cholmondeley, who has since been killed. Mr. Perry, on leaving Amiens, appears to have stalled his machine, *i.e.*, to have attempted to climb too fast, with the result that the machine lost speed, turned on its side, fell to the ground, caught fire, and Mr. Perry was killed. Mr. Perry was pleased with the performance of his machine on the flight to France, and spoke of it as the pick of the bunch. The aerodrome at Amiens is particularly large. Mr. Perry was an experienced pilot. The type of machine has been abandoned. It was not successful and was somewhat under-engined. and was apt to lose speed quickly in the air. It was abandoned because it was not fast, and not sufficiently better than other machines then in use to justify its continuance at the Front. It is still used for training.

Conclusion.—There was no negligence in giving this type of machine to an experienced pilot, as Mr. Perry was; although, with the 80 h.p. Gnome engine with which it was then fitted it required careful handling, especially in climbing, to prevent its losing its flying speed.

In considering whether the use of a particular type of machine was or was not negligent, it is necessary to bear in mind the enormous progress that has been made during the war in the development of aeroplanes and engines by ourselves and by other nations engaged in the war, although probably even yet no absolutely reliable type has been evolved. The question of negligence in the use of a particular type of machine must always be determined with reference to the types of machines and engines available at the date when a given accident occurred. It might be quite proper to use in the early stages of the war an aeroplane whose use to-day would be wholly wrong.

(*b*) No. 11. Hansard.—Machine caught fire in air with experimental Royal Aircraft Factory engine. Bombs on board burst ; pilot burnt to death in air.

Supplemental statement.—Date November 5th, 1914. Place, Farnborough. Person killed, E. T. Busk. Type of machine, B.E. 2. Killed while doing experimental work for the Air Service.

Facts.—Mr. E. T. Busk was conducting experimental work in the air. He was an experienced and intrepid flier, and had the rare faculty of being able to note and report upon the effect in actual flight in the air of experiments in construction and design. His work was highly dangerous, and he was killed while performing it. His death was described by General Henderson as one of the greatest losses to aeronautics we have ever suffered. The Committee desire to endorse the statement.

Conclusion.—There is no evidence of negligence in the death of Mr. Busk, whose loss was due to the exceptionally dangerous nature of the work to which he devoted himself.

(*c*) No. 14. Hansard.—Lost at sea flying on leave. "It is a very pernicious habit in France, that where there is an old machine which they want to get back and which is no use for any further service and a pilot is going home on leave, if he likes to go home in it he can do so. It is a dangerous habit to endanger a valuable pilot's life to get an old crock of an aeroplane back to England and thus save transport."

Supplemental statement.—Date, December 30th, 1914. Machine, Bleriot monoplane. Lost in Channel. Pilot, Captain Picton Warlow.

Facts.—The machine was a two-seater Bleriot monoplane, a type that was in process of being discarded as too slow in climbing with full military load. As these machines could be spared from service at the Front such of them as were serviceable as school machines were sent home. Officers on leave were allowed as a privilege to fly them. This machine was overhauled before starting, and Captain Warlow tested it by a short trial flight. The weather was clear, but there were some high banks of clouds, and it is supposed that Captain Warlow got into the cloud banks and lost his way, exhausted his supply of petrol, and came down into the sea. He was supplied with petrol sufficient for twice the distance of his intended flight.

Conclusion.—The very serious suggestion that Captain Warlow was allowed to risk his life on an "old crock of an aeroplane" to save transport is entirely unfounded. How the accident happened can only be surmised, but the machine was, as far as could be ascertained, in good order, and there was no negligence in allowing Captain Warlow to fly in it.

(*d*) Numbered 15 by Mr. Pemberton Billing, but not in Hansard.

Statement.—Date, December 30th, 1914. Pilot, Captain W. Lawrence. Place, France. Machine said to be obsolete; wings folded up in the air. Mr. Pemberton Billing says he obtained the information from an officer who saw the accident.

Facts.—The machine was a Blériot—a type now superseded for the reasons given in the last case. Captain Lawrence, an experienced pilot, was about to take part in a bombing expedition against a difficult target. Captain Lawrence was of opinion that the best way to achieve his object was to approach the target, which was well protected by anti-aircraft guns, at a great height, to dive down to within 200 or 300 ft. of his objective, then to flatten out, drop his bombs, and climb again. He decided to test this theory behind our own lines. He climbed to between 5,000 and 6,000 ft., then dived straight down with his engine full on for something like 3,000 ft., when his machine broke up, whether in the act of trying to flatten out or not cannot be definitely ascertained.

Conclusion.—The Blériot type has been discarded, not because of weakness, but in due course of evolution in favour of better machines. Captain Lawrence, by this manœuvre, subjected the machine to an unbearable strain in all probability in flattening out. There is no evidence of undue weakness or defect in the machine or of any other negligence.

(*e*) No. 19. Hansard. Bombs blew up when landing. Killed.

Supplemental statement.—Date, January 21st, 1915. Place, Dunkirk. Pilot, Captain Roche. Suggestion, improper design of bomb or faulty attachment to the aeroplane.

Facts.—Captain Roche's machine and his body were found in the sea off Dunkirk. Bomb explosion was heard. No one saw the accident, and it is impossible to state exactly what happened.

Conclusion.—The probabilities are that Captain Roche was obliged to descend owing to engine failure, and either that finding himself near the ground he dropped his bombs so as not to have them in the machine on landing, or the bombs exploded on landing. Against this latter theory are the facts that the aeroplane apparently landed in the sea and that Captain Roche's body was uninjured by bombs. If the former theory, which seems most likely, is right, there is nothing in the suggestion of improper design of bomb or faulty attachment. If the latter theory is right, the fact is that the safest method of attachment of bombs to aeroplanes was not then and probably is not yet known. Continual experiments and improvements are being made, but even now it is not always possible to prevent bombs exploding when a forced and violent landing is made. Bombs themselves were much more faulty in construction and liable to explode in January, 1915, than now, when many improvements in the direction of increased safety have been carried out. There is no evidence at all of the neglect of any known precautions, and, moreover, the bombs do not appear to have been the cause of death. The Committee would refer their observations on case (*a*) as to the necessity of bearing carefully in mind the date of any given accident. As in the case of aeroplanes and engines so with bombs, continual improvements are being made both in the manufacture of bombs and in their method of attachment.

(*f*) No. 24. Hansard.—Spiral dive 300 feet over the sea. Killed.

Supplemental statement.—There is a mistake in Hansard. It should read "B.E." instead of "over the sea." Date, February 25th, 1915. Place, Central Flying School, Upavon. Pilot, Lieutenant T. Dawson Downing.

Suggestion by Mr. Pemberton Billing that the machine was a B.E. 2 C., an inherently stable machine, which he describes as apt to take nose dives and unable to right itself in under 500 feet. That pilots take liberties with it on account of its inherent stability, and that this accident may have been due to over-confidence in the machine engendered by its stability.

Facts.—The machine in question was not a B.E. 2C., but a B.E. 2B., which is not an inherently stable machine. The engine was a 70-h.p. Renault.

Conclusion.—Mr. Pemberton Billing's suggestion fails because he is mistaken as to type of machine. It was supposed at the time that Lieutenant Downing became incapacitated while in the air, perhaps from a fainting fit. This may have been so, but it is only surmise. Nothing can be alleged against the machine, which was examined and in good order before starting.

(*g*) 30. Hansard.—Shot down, flying low, in bad weather. Died of injuries. Ordered out on bomb raid in the dark and rain.

Supplemental statement.—Date, 29th March, 1915. Place, Lille. Pilot, Lieutenant St. J. Warrand. Machine, B.E. Number unknown, suspected to be a B.E. 2C. If so, machine too slow.

Facts.—The machine was a B.E. 2C. Captain Warrand with two other officers started on a special bombing expedition before daylight. As day broke it became foggy. Captain Warrand and one officer went on and reached their objective. The third lost his way. In order to do their work it was necessary to descend very low over a well-defended place. Both officers were brought down. Captain Warrand had his leg broken by anti-aircraft fire.

Conclusion.—There is here no trace of negligence. It was an occurrence such as is inevitable in war, and of which no doubt many instances could be given.

(*h*) No. 34. Hansard.—Killed in a side-slip. Typical of this type of machine.

Supplemental statement.—Date, 26th April, 1915. Place, France. Pilot, Second Lieutenant W. Polehampton. Machine, B.E. 2C. Accident occurred in getting off the ground. This machine is apt to take a side-slip if not up to its flying speed when it leaves the ground. The negligence was the use of this type of machine. There is special danger in the first 500 feet of the ascent and the last 500 feet of the descent with this machine.

Facts.—The accident happened at St. Omer.

Conclusion.—This was a regrettable accident such as happens from time to time. It would probably not have been brought forward but for the fact that it happened on a B.E. 2 C. machine. Mr. Pemberton Billing has criticised this machine severely, and, as the Committee understand him, goes the length of saying that to allow the use of a B.E. 2 C. machine for any purpose except that of flying in peace times, and then only by an experienced pilot, is negligence. The Committee entirely dissent from this view, and consider that, though somewhat slow, a B.E. 2 C. has always been relatively to other machines a safe machine to fly. There was no negligence in supplying Lieutenant Polehampton with a B.E. 2 C. machine.

(*k*) No. 43. Hansard.—Killed. Reported death was caused by bombs exploding in the air.

Supplementary statement.—Date, May 23rd, 1915. Place, France. Persons killed, Lieutenants Bewes and Hyland. No other information. Suggestion, careless handling of bombs and no proper bomb rack.

Facts.—These two officers were flying behind our lines and preparing to cross the enemy's trenches when a hand grenade they had with them exploded. Efficient racks were provided for the carriage of these grenades, but they require to be detached from the racks, and a safety device has to be removed before throwing. From the nature of the case nothing can be definitely ascertained, but it is presumed that the observer was getting the grenades ready for use and by accident dropped one of them upon the floor of the aeroplane, causing it to explode.

Conclusion.—It is impossible to find or even plausibly suggest any negligence in this case.

(*l*) No. 70. Hansard.—Killed in action while testing a type of machine condemned by the French six months ago.

Supplementary statement.—Date, August 24th, 1915. Type of machine, French Morane monoplane. Officer, Captain Mapplebeck. Place, Joyce Green. Not in action, as stated in Hansard. Safety belt of pilot fastened to three-ply wood with wooden screws, and pilot found to have fallen forward.

Facts.—The monoplane was fitted with an 80-h.p. Gnome engine. Captain Mapplebeck was ascending. He executed, when about 80 ft. from the ground, a sharp, heavily-banked right-hand turn. The machine spun round on its own axis and then nose-dived vertically. There was very little wind. The accident appears to have been due to the machine "spinning" on a heavily-banked turn, the pilot not having sufficient speed and height to regain control before hitting the earth. It is the fact that the French have largely, but not entirely, discarded this type of machine, as also have we. Both they and we continued to use a few as single seaters. It was a good machine in the hands of an expert flier, as Captain Mapplebeck was. It was, in fact, the type of machine on which the famous French airman, Garros, did such good work before he was brought down.

Conclusion.—The accident was due to an unfortunate error of judgment on the pilot's part. There is no evidence as to the alleged faulty attachment of the belt. Nor in the opinion of the Committee did such faulty attachment, assuming it existed in any way, contribute to the accident. It may be mentioned in passing that many pilots prefer not to use a safety belt. This type of machine was not one fit to be used by an inexpert flier, and had Captain Mapplebeck not been a pilot of experience the Committee would have considered it negligence to allow him to fly it. In view of Captain Mapplebeck's skill and experience the Committee do not think there was any negligence in supplying him with this machine.

(*m.*) No. 80. Hansard. Machine caught fire on landing. Pilot died.

Supplemental statement.—Date, September 24th, 1915. Machine, S.E. 4. Place, Hounslow. Pilot, Captain Blood. No suggestion of negligence made in this case, but a case for inquiry.

Facts.—Captain Blood appears to have made the same mistake as Captain Mapplebeck (case *l.*), and to have turned his machine at a low speed, thus causing a spin, and having insufficient height above the ground in which to regain control.

Conclusion.—No evidence of negligence.

(*n.*) No. 99. Hansard.—Killed, passenger. Engine failure. Side-slip and dive.

Supplemental statement.—Date, December 10th, 1915. Passenger, Lieutenant Croft. Engine failure. Side-slip with nose-dive. Type of machine not known. Sounds awfully like a B.E. 2 C. That is the peculiarity of the B.E. 2 C.—engine failure, side-slip, failure to recover.

Facts.—The pilot was Lieutenant Macdonnell. The place, Castle Bromwich. The machine was an Avro and not a B.E. 2 C. The pilot was banking his machine at a normal angle to make a turn at a comparatively low altitude (estimated at about 250 feet) when a gust of wind caught the machine causing it to bank very suddenly at an abnormal angle. The pilot endeavoured to right the machine and in so doing put its nose down. This caused a nose dive with a slight spin, and the machine fell heavily. The weather was "bumpy," but Lieutenant Macdonnell had been up three times before that morning and said it was not too bad to fly.

Conclusion.—The only negligence suggested was that the machine was probably a B.E. 2 C. This is a mistake; the machine was an Avro, a machine which Mr. Pemberton Billing several times cited as being safer than a B.E. 2 C. Had he known that the machine was an Avro he would probably not have thought it worth while to refer to this incident.

(*o.*) Not in Hansard.—Major Unwin's case.

Statement by Mr. Pemberton Billing:—Major Unwin died on March 20th, 1916, from injuries received on January 31st, 1916. Place, Joyce Green. Major Unwin was telephoned by the War Office, or by his Wing Commander, to send up two pilots on the night of January 31st, when a Zeppelin raid over London was anticipated. He replied, "We have no suitable machine here. The ground is not suitably lighted. There is a thick ground fog and it is not safe for anybody." Major Unwin had never previously flown at night. He said, "I will not disobey orders; I will go up myself." His machine, a B.E. 2 C., caught a tree in descending and was burnt, Major Unwin receiving the injuries to which he afterwards succumbed.

Facts.—News had been received of a Zeppelin raid on the north-east coast, and it was thought (erroneously as it turned out) that a Zeppelin was making for London. Orders were sent to Major Unwin at Joyce Green giving him the information, and telling him to send up aeroplanes "if the weather conditions were suitable." There was a ground mist, although not dense at that particular place. Major Unwin, who was an experienced night flier, decided to go up himself. In descending he came down too low before reaching the landing ground, probably due to the fact that he was new to Joyce Green, and dashed into some trees, with the result that his machine was burnt and he received the injuries from which he died. The ground itself is not a bad one to land upon and was well lighted. There was no engine failure. There is always danger in landing at night owing to the fact that while a pilot can see the guiding flares he is often unable to see obstacles like trees or hedges between himself and the ground as he gets low down for the purpose of landing. This danger is increased when there is a fog or ground mist. It is entirely untrue that Major Unwin had imperative orders to send up machines. Such orders are never given. The orders are always subject to the weather conditions, of which the officer in charge of the aerodrome is left to judge for himself. The Committee can discover no foundation at all for the unsupported suggestion of Major Unwin's alleged protest.

(*p.*) Closely connected with the last case is that of Major Penn Gaskell. This was not an instance brought forward directly by Mr. Pemberton Billing, but was referred to in a letter read by him to the Committee. The unknown writer of the letter says:—"Major Penn Gaskell, Squadron Commander at Ruislip, received an order to send an airman up as they expected a Zeppelin visit. He telephoned back that it was foggy and that it would be suicidal for anyone to go up. The War Office replied insisting on someone going up. Major Penn Gaskell said he would go up himself and that he knew he was going to his death, and like a true hero went up. It was so dark that he ran into a tree. His petrol tank burst and he was burnt to death, but he lived long enough to say he never expected to come down alive. He was a skilled man lately returned from the Front, and was beloved by all."

The facts are: The date was January 31st, 1916. The place was Northolt. The machine was a B.E. 2 C. The weather conditions were the same as in Major Unwin's case, *i.e.*, a low mist. The orders were to go up if the weather permitted. It was the turn of Captain Sampson to go up, but Major Penn Gaskell told him not to go, and that he (the Major) would have a "chucker" round. He, too, like Major Unwin, caught a tree in descending. The tree was some three-quarters of a mile away from the landing ground. The machine caught fire. The glow could be seen from the landing ground. Major Penn Gaskell was extricated, but afterwards died. He was a most experienced night flier. The landing ground was properly lighted. Major Penn Gaskell made no protest. He did not refer to the danger of going up and say that he was going to his death. He said he would have a "chucker" round to see if it was any use sending airmen up. The Northolt ground is large with a good surface, and safe.

The cases of Major Penn Gaskell and Major Unwin call for special mention. Both accidents happened on the night of January 31st last. A Zeppelin raid was anticipated over London. The night was foggy. Orders were issued to the aerodrome at Northold and Joyce Green that aeroplanes were to go up "if the weather conditions were favourable." It was not the duty of either of those gentlemen to go up himself. The conditions were unfavourable. No one could have blamed them if they had reported that it was impossible to fly. They determined that machines should go up, but as the risks were great each of them went up himself rather than send up a pilot as in normal circumstances he would have done. In each case this self-sacrificing devotion cost the officer his life.

Both these officers were expert fliers. Both had had experience of night flying. The Committee are grateful for having this opportunity of placing these facts on record as a tribute to their memory. It is outside the province of the Committee to do more than refer to the no less gallant conduct of the men who, immediately on hearing of the accidents to these two officers, went up to take their places.

(*q*.) No. 205.—Not in Hansard.

Statement by Mr. Pemberton Billing.—Desmond Arthur was killed on some type of B.E. machine which had been repaired by the Royal Aircraft Factory. The repaired part broke at 4,000 ft. up and the pilot was pitched out.

Suggestion.—Faulty design or bad repair.

Facts.—The date was May 28th, 1913. The place, Montrose. There was a suggestion made at the time that there had been a patch on the outside of the right wing of the plane, and that someone had broken the tip of the wing, then repaired it, and put a patch over the repaired part, the suggestion being that this was done by someone with a view to hiding some damage which he had done to the machine. The matter was closely inquired into at the time by a Committee of which Mr. H. T. Baker, M.P., was Chairman. The Committee have had the notes of the whole of the evidence given to that Committee before them. There were some 23 witnesses. The suggestion depends on the unsupported evidence of one man out of these 23 witnesses. No useful purpose would be served in re-opening the matter, especially as some of the witnesses called have since been killed. A perusal of the transcript of the notes of evidence leads to the conclusion that the suggestion of the patch is quite unfounded.

To sum up, flying even at home is at present attended with considerable danger. It is imperative that every precaution should be taken to reduce that danger to a minimum. No one could complain if Mr. Pemberton Billing had asked that these cases should be inquired into to ascertain whether the deaths of the men might have been prevented, but to base upon these accidents charges of criminal negligence or murder is an abuse of language and entirely unjustifiable.

The Committee think it right to say that Mr. Pemberton Billing made other criticisms and suggestions of a totally different character. Some of these deserve and will receive careful consideration.

There is one general observation the Committee desire to add to this interim report. There has been an enormous expansion of the Flying Service since the war, and all the critics of the Service without exception have borne testimony to the great progress made in its efficiency—a progress which, although most noticeable since the beginning of this year, is in the opinion of the Committee the result of many months of strenuous work. To this efficiency the recent reports from the front bear eloquent witness.

The members of the Committee are: The Hon. Mr. Justice Bailhache (*Chairman*); General Sir H, L. Smith-Dorrien, G.C.B., G.C.M.G., D.S.O.; The Hon. Sir Charles Parsons, K.C.B., F.R.S.; Messrs. J. H. Balfour Browne, K.C.; J. G. Butcher, K.C., M.P.; Edward Shortt, K.C., M.P.; Charles Bright, F.R.S,E., with Mr. D. Cotes-Preedy, M.A., LL,M., as *Secretary*.

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AVIATION IN PARLIAMENT.

Air Board Policy.

Mr. Brookes, on August 9th, asked the Prime Minister whether before the holidays he will be in a position to make any statement on the policy of the Air Board?

Major Baird (representing the Air Board): My noble friend proposes, during the recess, to make a report to the War Committee. Until that report is in the hands of the Prime Minister, he will not be in a position to make any statement on the subject.

Anti-Aircraft Defences.

Mr. Brookes asked the Secretary of State for War whether he is now satisfied that he has at his disposal all necessary means for dealing with the Zeppelin attacks; and, if not, whether he is taking adequate measures to obtain them?

Major Baird: I regret that I cannot add anything to the written answer which I gave on 31st July to my hon. friend, wherein I stated that the development of air defences of the country has made great progress, and is proceeding as rapidly as the manufacturing output and the needs of our forces abroad permit.

Mr. Billing: Will the hon. gentleman say whether that still holds good after last night's raid; whether women and children were killed last night; and whether that is likely to recur under the existing organisation of the defences?

Major Baird: It still holds good, and all the more! The hon. member must know that these unfortunate things cannot be avoided in time of war. We are greatly improving the defences, and I think the Germans are more aware of it than anybody else.

Mr. T. Ferens asked on August 10th if it is a fact that in one important city on the East Coast in which lives were lost early on the previous morning through an air raid that there was only one gun and one poor searchlight used; and will he take means to ensure that adequate defences against air raids are provided and brought into action when necessity arises?

Major Baird (representing the Air Board): The Zeppelin which crossed a portion of the town referred to was fired at during the whole of the time that it was within effective range of the anti-aircraft defences. It passed high over the town and at great speed. The searchlight used was of a recent and powerful type. The anti-aircraft defences of the locality have been strengthened during the last month, and further improvements are being made in accordance with the general scheme of anti-aircraft defence, which is being carried out as rapidly as circumstances permit.

Sir J. Walton: Is the hon. and gallant gentleman aware that the searchlight failed at another point on the coast?

Major Baird: I shall be very glad to have any matter connected with searchlights investigated if the hon. Baronet will be kind enough to give me details.

Mr. Pringle: In view of the number of raids which have taken place in this town, could the Department not have done better in the matter of the provision of guns by this time?

Major Baird: I do not think so.

Removal of Anti-Aircraft Guns, &c.

Sir A. Gelder, on August 14th, asked the Secretary for War why the protection by anti-aircraft guns had been taken away from a certain city on the East Coast after having been used so effectively to repel attacks by Zeppelins for several months past; whether the removal of such guns had resulted in a serious loss of life and property on August 9th; and whether the military authorities were taking proper steps to immediately replace the guns removed by others of at least equal capacity and number, together with suitable searchlights, for the due protection of the city so that at least it might be guarded as fully as in the past.

Major Baird: The suggestions contained in this question are based on an entire misapprehension of the facts in regard to the defence of the particular town which I presume my hon. friend has in mind. It would not be in the public interest to make any detailed statement on the matter. No guns have been removed except on replacement by guns of greater efficiency. The searchlights available in this town are of the approved pattern, and are effective under normal conditions. But their efficiency is inevitably diminished should there happen to be fog and mist.

Sir A. Gelder: Is the hon. and gallant gentleman aware that the statement made on Thursday last in reply to an hon. member and the statement made to-day are quite contrary to the testimony of thousands of people who witnessed the raid?

Major Baird: I am aware that there have been statements made of that kind, but I have given the hon. gentleman the facts, and he cannot get over the facts. The facts are as stated.

Mr. Churchill: Is the Air Board responsible for these arrangements?

Major Baird: No.

Mr. R. Harcourt: May I ask whether questions on this subject are now addressed to the Air Board, and not to the War Office?

Major Baird: I am asked to answer these questions by my right hon. friend the Secretary of State for War.

Mr. Billing: Does the hon. and gallant gentleman definitely state that no guns whatsoever were removed from this particular town between the last raid and the one previous to it?

Major Baird: No, Sir, I said nothing of the kind. I said what is the truth, that when guns have been removed they have been replaced by better ones.

AIRISMS FROM THE FOUR WINDS.

A RE-SHUFFLING of the members and constitution of the Parliamentary Air Committee was accomplished last week. At the first meeting on Wednesday a large number of members of both Houses attended at the House of Commons and an executive committee was constituted as follows:—Mr. Wilfrid Ashley (Chairman), Lord Montagu, Lord Strachie, Lord Peel, Sir Charles Nicholson, Mr. Basil Peto, Mr. Shirley Benn, Sir E. Cornwall, Major the Hon. A. C. Murray, Mr. Joynson-Hicks, and Mr. H. A. Watt, with Capt. Alan Burgoyne as hon. secretary.

One idea in the minds of the promoters is the bringing about a co-ordination of the air services, the ways and means of which are this week being gone into, as well as a determination as to the general policy to be adopted.

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BY way of a first dive into affairs Aviatic, a contingent of the Committee has availed itself this week of an invitation from the authorities to visit Farnborough. An ounce of practice is worth a ton of theory—sometimes.

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THE lighter-than-air side of aircraft is also in the programme.

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MATTERS Hendon way should be improved if the possibilities of access were more acceptable than at present. This has now become something more than a public convenience—it is a commercial necessity.

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THE solution rests with the railway company concerned and we have hopes that they will rise to the occasion.

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AVIATOR (*perhaps*) *home from the war on leave*: "And then when you are up pretty high—three or four miles, say—and you look down it's positively sickening. It is stupendous, awful. A great height is a fearful thing, I can tell you."

Intense female audience (*feelingly*): "Yes, I can sympathise with you, poor boy. I feel just that way myself when I'm on top of a step-ladder."

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WILL the Mothers be conveyed to Hanworth Park by aeroplane next Mothers' Day?

– – –

A CORRESPONDENT asks "Why not inaugurate a 'Mothers-in-law's Day,' and take them up in an aeroplane (not strapped in) and loop-the-loop?"

– – –

"FLYING at Hanworth."

– – –

THE Whitehead 200-acre Aerodrome is the next development.

– – –

MR. J. A. WHITEHEAD is *some* hustler.

– – –

WITH H. Sykes to test and stunt for the new 'drome, it looks like another get-going-quick Whitehead success.

– – –

HOWEVER, "Wait and See."

– – –

QUARTERLY air-raid insurance policies are *not* likely to come into operation. There are evidently some over-optimistic would-be insurers around, for agitation to be worth elaboration in this direction. Better to stop talking and insure right away.

– – –

AIR-RAID insurance as a National asset is an accomplished fact. Best now to leave it at that, when it comes to splitting premiums into quarterly payments. The present workers for making the liability a national one should have awakened in September 1914, and joined "FLIGHT" in its campaign then.

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BUT it probably was no concern of theirs *then*. It only affected somebody else, poor fellows. What an unselfish creature man is to be sure, until he is found out.

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PASSENGER flights on a 100-h.p. machine sounds attractive.

– – –

VISITORS to Hendon may be able to indulge shortly.

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THE Grahame-White "pusher" biplane exhibited at the last Olympia Aero Show will in all probability be somewhat altered and put into commission again.

GLAD to hear it. It did seem a pity to discard this machine without giving it a thorough trial. It embodied a good many novel features.

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As nearly as one can judge from an inspection of the 'bus few alterations should be necessary to turn it into a very serviceable passenger carrier. If the tail booms are slightly lengthened, and possibly the wings shifted a little, the balance should be about right.

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VERY astonishing to the uninitiated and very interesting to those privileged to watch, was the unique demonstration presented for the edification of Major-General Sir Sam Hughes and his staff at Messrs. Vickers' flying ground on August 9th. Commander Sir A. Trevor Dawson, R.N., vice-chairman and managing director, welcomed the visitors, who saw some exhibitions of Fokker fighting on Vickers gun 'buses, while Raynham and Barnwell on the scouts gave a magnificent display, not forgetting the looping. We know those Vickers 'buses and so do the Boche flyers!

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Is the aeroplane as we know it to-day the right solution of the problem of flight?

– – –

ARE all other forms of lift doomed to failure?

– – –

PERHAPS the direct lift or helicopter is, but what about the ornithopter or wing-flapping machine?

– – –

IF a man can lift some 80 lbs. by flapping a pair of wings, how much will a petrol engine lift per horse-power?

– – –

THINK it over.

– – –

THERE appears to be something in the Passat wing-flapping machine, and since its original début it has passed quite beyond the wild freak machine stage. Only shows what solid conviction and consistent perseverance will do. It is only at present a decent sized crude model, but the lift is there, the power of forward motion appears to be, whilst after a short demonstration controllability and the ability to glide seem not impossible.

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Is the "flapper" to be the solution to the call for increased power upon power after all? Who knows?

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HAWKER gave a pretty exhibition of flying over the Karsino during the entertaining there, by the Lord Mayor, of wounded soldiers.

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BANKING and looping were just the things the "Tommies" wanted to see.

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"THEY do that out there, over the German lines," said one. "Wouldn't care about their job, myself. Give me a nice safe trench."

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UNDERSTAND that "some" flying can be seen in the neighbourhood of Coventry; banking and looping and what not, day by day, "Moore and Moore."

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ONE of ours home from the front endorses the general opinion of our R.F.C. He says "They are 'some' b-hoys."

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WHO will be the first to solve the problem of putting the "beef" into an engine at great heights?

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HOW can it best be done?

– – –

FORCED induction of some sort *appears* to be an easy way out of the difficulty, but if it is as simple as it looks, why hasn't it been done already?

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ARE the Germans using it on some of their Fokkers? At any rate they are in all probability using it on their Zepps., where a reservoir with air maintained under pressure can easily be installed; in fact, probably already is, for keeping up the pressure in the ballonnets.

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AT a height of a little over 20,000 ft. the density of the air is only half of that at sea level. In other words, if the engine maintains its power at that altitude and the propeller gives the same efficiency, you travel twice as fast. Isn't it worth trying for?

Special Constable (*To young mother in night attire at the window*): "Be calm, madam. They've driven off the Zeppelins."

Young Mother: "Oh, Constable, dare I venture to take baby out of the safe?"—*Punch.*

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Passenger flights are booming at Bournemouth.

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The wind had a grudge against Manton last Saturday, for the worst spasms indicated on the wind gauge coincided exactly with Manton's turns up with passengers.

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Rock-a-by Manton, up in the sky,
When the wind blows, it's your turn to fly.
When the flight's over, the wind it will fall,
Up will go Pashley, Winter, and all.

The U.S. National Advisory Committee has appointed Prof. Charles E. Lucke, of Columbia University, Chairman of a Committee to ascertain the carburettor best suited for aircraft work, with a view to standardisation.

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Since February, 1915, employees in the older branches of Boulton and Paul have maintained two beds for wounded soldiers at Norfolk and Norwich Hospital. The aircraft and other employees now propose to join in and maintain two more beds.

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B.P., the new house organ of Messrs. Boulton and Paul, has made a most auspicious start, and should do much in furthering the clan spirit among the workers. It is evident that the staff of the firm includes several who can use pen and pencil to effect, and their efforts to interest and amuse should be fully appreciated month by month.

"MOTHERS' DAY."

Mr. J. A. Whitehead, of the Whitehead Aircraft Company, Richmond, is to be congratulated upon the successful result of "Mothers' Day," which was celebrated last Tuesday week, when Mrs. Whitehead and himself entertained some 300 or 400 mothers of soldiers and sailors at Hanworth Park, Feltham. It is unnecessary to say that the mothers thoroughly enjoyed their day's outing, for with Mr. Whitehead as host things could not be otherwise; from which it will be gathered that everything was thought out and executed with characteristic "Whitehead thoroughness." Mothers from all parts of London were conveyed by brakes, motor char-à-bancs, and cars to Hanworth Park, where a sumptuous lunch awaited them. After the repast various kinds of sports were put up, for which many prizes were offered. Aviation had its full share of the proceedings, for throughout the afternoon numerous machines flew over the grounds from a neighbouring aerodrome, whilst the event of the afternoon was the appearance of H. Sykes, with Mr. Paterson, on the Martinsyde from Hendon. On arriving over the grounds he executed a number of loops and tail slides, much to the delight of the spectators, and then the excitement commenced. It was originally intended that he should land in a field adjoining the park, but as this field was rather small and surrounded by trees, to say nothing of the unfavourable direction of the wind, this was by no means an easy matter. After several very plucky attempts, Sykes wisely abandoned all thoughts of landing there, and flew over the tree-tops, and we saw him descend out of sight some few fields away. It was not without some anxiety as to his safety that some of us ran across-country to where he disappeared from view, so we were much relieved, on arriving at the field in which he had landed, to find pilot, passenger, and machine intact. A policeman being put on guard over the machine, Sykes was conveyed back to the park in triumph, where he was received by Mr. Whitehead, who made a stirring speech to his guests on the importance of Britain's supremacy of the air, and also thanked the pilot for his flying visit and exhibitions. Then came tea, after which the sports were brought to a conclusion, and Mrs. Whitehead presented the prizes. "Mothers' Day" being also Mr. Whitehead's 41st birthday, the employees of the company made a presentation to their chief, which took the form of a rose-bowl with the following inscription engraved on it:—"Presented to J. A. Whitehead, Esq., at Hanworth Park, on his 41st birthday, 8th August, 1916 (now known as Mothers' Day), by the employees of Whitehead Aircraft, whose names are inscribed hereon, as a mark of appreciation of his kindly thought and friendship towards all employees, who wish hereby to express their loyalty to their chief and their intention always to work for the best interests of Whitehead Aircraft." There were the names of about 1,000 employees on the bowl! The staff also presented a silver dessert service, and the complete Bombay edition of Rudyard Kipling's works. Many will remember "Mothers' Day." May there be many other such days, equally successful in the future.

Mothers' Day at Hanworth Park—Mr. Whitehead examining the silver rose-bowl which was presented to him by 1,000 of his employees. Mrs. Whitehead is seated on the left.

Personals

Casualties.

Second Lieutenant L. Latimer Clark, R.H.A., attached R.F.C., the only son of Mr. Lyonel Clark, M.Inst.C.E., M.Inst.N.A., and Mrs. Clark, of 105, Grosvenor Road, S.W., was born in 1898. He joined the Inns of Court O.T.C. in March last year, was gazetted in August to the Leicestershire R.H.A., and was attached to the R.F.C. as observer last spring. He went with his squadron to the front six weeks ago, and got his Observer's wings after a successful reconnaissance in which he brought down a Fokker. He was on similar duty on August 2nd, when his machine was hit by anti-aircraft fire, and crashed down behind the enemy's lines. He was educated at Bedales and Clayesmore Schools.

Second Lieutenant Hugh Courtney Davis, Royal Berkshire Regiment, attached R.F.C., was the youngest son of Mr. and Mrs. E. C. Davis, of Dalhousie Square, Calcutta. He was in his twentieth year, and was educated at Oundle, where he held a scholarship. Here he gained distinctions in football, cricket and hockey. In the spring of 1915 he received a commission in the Royal Berkshire Regiment, and last March he was attached to the R.F.C. and received his wings in July. He went to the Front on August 1st, and met with a fatal accident on returning to his aerodrome on August 5th.

Commander Humphrey Finch Dawson, R.N., whose death is officially announced as having taken place at the Naval Hospital, Chatham, was 40 years of age, and entered the Navy in January, 1890. He was sub-lieutenant on board the "Thrush" during the Sierra Leone trouble of 1898, and was employed in keeping open the lines of communication in the Sherbro district. During the South African War he served on the Delagoa Bay blockade as lieutenant in the "Widgeon," and afterwards patrolled the south coast of Cape Colony, receiving for his services the South African medal. Commander Finch Dawson, who had specialised in navigation, retired in May, 1912, but had latterly been attached to the Royal Naval Air Service.

Captain William Assheton Summers, 18th Hussars and R.F.C., who is believed to have been killed by a direct hit from an anti-aircraft gun on August 1st, was the eldest son of Mr. and Mrs. F. B. Summers, of Froyle Place, Alton, and was 20 years of age. He was educated at Eton and Sandhurst, and received a commission in the 18th Hussars in March, 1914, and went out with his regiment in the early days of the war. He transferred to the R.F.C. in May, 1915, and was promoted flight-commander in March, 1916. On July 28th he was awarded the Military Cross. His Brigadier writes: "Your boy was quite the most stout-hearted in a very brave lot of pilots, and our superiority in the air here is largely due to him and to the example he set to others. I had his name down for further reward for his extraordinarily fine work in this battle."

News has come to East Yorkshire of the death in one of the base hospitals in France of Lieutenant David Wilson, of the R.F.C., previously of the East Yorkshire Regiment, who succumbed to injuries suffered during a flight on Sunday, July 30th. He was awarded the Military Cross in May of this year, and had just been posted flight-commander and detailed for duty with another squadron, being under orders to transfer the next day. He was the son of the late Rev. David Wilson, and a nephew of the first Lord Nunburnholme and of the late Mr. Arthur Wilson, of Tranby Croft, East Yorkshire.

Second Lieutenant Gerald Lovell Backhouse, Norfolk Regiment, attached R.F.C., who was killed on August 2nd in a flying accident, was the second son of Mr. and Mrs. H. C. Backhouse, of 14, Ailesbury Road, Dublin, and Dundalk. He was educated at Shrewsbury, where he was in the O.T.C. He went to Sandhurst, and was gazetted to the Norfolk Regiment at the age of 17. He was later attached to the R.F.C. His commander, in a letter to Lieutenant Backhouse's friends, spoke in the highest terms of his ability.

Second Lieutenant C. De Frece, who met his death last week in the regrettable collision in mid-air recorded elsewhere, was the only son of Mr. Alfred De Frece, solicitor, 2, Devonshire Square, E.C., and was barely 19 years of age. Educated at the Haberdashers' School, Taplow, the London Grammar School, and Brussels, he was intended to become an electrical engineer, and to that purpose was a pupil of Professor Silvanus Thompson. In October of last year, shortly after his eighteenth birthday, he joined the Middlesex Yeomanry, and in June obtained a commission in the R.F.C. He was regarded as a very promising flight officer.

Lieutenant George Rogers, who was the unfortunate pilot of the machine which met with the collision in mid-air last week, was a member of a well-known Canadian family, his home being at Barrie, Ontario. He was a member of the Canadian Expeditionary Force, 23 years of age, and a pilot of considerable experience and skill.

Second Lieutenant Martyn Tulloch Vaughan-Lewes, Welsh Regiment and R.F.C., who died on July 22nd from injuries received in a flying accident on July 15th, was the son of the late Captain Price Vaughan-Lewes, R.N., C.B., D.S.O., and Mrs. Vaughan-Lewes, Glenroy, West Lulworth. He got his commission in the Welsh Regiment in August, 1914, and went to the Front in the spring of last year, and was wounded. On resuming duty he was attached to the R.F.C.

Wounded.

When pursuing a Fokker machine, at a height of 12,000 ft., Second Lieutenant John Bernard Hinchcliff, attached to the R.F.C., stood on his petrol tank the better to obtain a view of his foe, and was struck in his back by a piece of shrapnel, fired from an anti-aircraft gun. He is now in hospital in London. Lieutenant Hinchcliff is the only son of Mr. and Mrs. John Hinchcliff, residing in Carleton Grove, Pontefract.

Married and to be Married.

An engagement is announced between Capt. N. A. Bolton, R.F.C., eldest son of Mr. and Mrs. Bolton, Highcroft, Sutton, and Ethel, younger daughter of Mr. and Mrs. Thring, 1, Springfield Place, Bath.

The marriage arranged between Captain Ian Duff, of the Dorsetshire Regiment and R.F.C., and Miss Kathleen Chinnery-Haldane, will take place at 2 p.m. on August 30th at St. Mary's Cathedral, Edinburgh. All friends will be welcome at the church and afterwards at the Roxburghe Hotel, Charlotte Street.

A marriage has been arranged, and will take place at noon on September 14th, at the Chapel Royal, Savoy, between Flight-Lieutenant Cecil H. Hayward, son of the late Mr. James Hayward and Mrs. Hayward, of Ceylon, and Neroberg, Ventnor, I. of W., and Doris, youngest daughter of the late Mr. and Mrs. Arthur Gard, of Belvedere, Kent, and Uplands, Ealing.

An engagement is announced between Captain E. F. Norris, R.F.C., only son of the late Lieutenant-Colonel E. E. Norris, R.F.A., and of Mrs. Norris, Harrow Weald, and Ileene, only daughter of Mr. and Mrs. Henry Aste, of Carlton Hill, N.W.

Second Lieut. William Witcomb Stainer, R.F.C., only son of Mr. and Mrs. W. J. Stainer, of Hove, Sussex, was married at Christ Church, Edinburgh, on August 12th, to Beata Gwenllian, younger daughter of Mr. and Mrs. W. Kilmister, of Edinburgh.

An engagement is announced between Major Sandford Wynne-Eyton, R.F.C., younger son of Col. Wynne-Eyton, of Plas-Issa, North Wales, and Frances, only daughter of Mr. and Mrs. Carbutt, of 122, Westbourne Terrace, W.

Items.

Included in the party of British prisoners from Germany, which arrived at Berne from Constance on August 12th, was Capt. F. Wilson, R.F.C. He has gone to Mürren.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *Admiralty, August 8th.*

"On July 30th, in conjunction with the French, an attack was made by British naval aeroplanes on the benzine stores and barracks at Mulheim. The machines met with very heavy anti-aircraft fire, but succeeded in gaining their objective, and carried out a successful bombardment. Our machines returned safely."

War Office, August 8th.

"A bomb attack by aeroplanes over Port Said and Suez inflicted little material damage, and caused slight casualties."

General Headquarters (France), August 8th, 1.45 p.m.

"An enemy squadron of 10 aeroplanes endeavoured to cross our lines yesterday on a bombing expedition. They were cut off by one of our offensive patrols of four machines. The enemy machines scattered and returned precipitately, pursued by our patrols. Two of the hostile aeroplanes had to make forced descents behind their own lines."

Admiralty, August 9th.

"At daybreak this morning, under heavy fire, an attack was carried out by naval aeroplanes upon the enemy airship shed at Evere, near Brussels. The objective was successfully bombarded from a height of 200 ft., and eight bombs were observed to hit the shed. Heavy columns of white smoke were seen to issue. Our machines returned safely."

General Headquarters, August 9th, 10.12 p.m.

"As a result of aeroplane co-operation with our artillery several enemy guns have been destroyed and some magazines exploded. A train was set on fire by bombs dropped from our aeroplanes.

"Hostile aircraft have been more active, but have obviously been trying to avoid combats. Several enemy machines were, however, damaged by our aeroplanes and infantry fire."

General Headquarters, Aug. 10th, 9.40 p.m.

"Our aeroplanes continued bombing operations against the enemy's billets and other points of military importance.

"In the course of many aerial combats yesterday several enemy machines were driven down in hostile territory, and three of ours have not returned."

General Headquarters, Aug. 11th, 10.55 p.m.

"In addition to numerous daily raids successful long-distance raids have recently been carried out by the Royal Flying Corps against the following objectives: The Zeppelin sheds at Brussels; railway sidings at Mons; railway sidings and airship sheds at Namur; Busigny railway station twice; Courtrai railway station twice. Of the 68 machines in all which took part in these raids only two failed to return."

General Headquarters, Aug. 13th, 10.17 p.m.

"North of Pozières the enemy were observed by an aeroplane to be concentrating in large numbers behind Mounauet Farm. Artillery was directed on them and was seen to be very effective, the enemy scattering wildly in all directions. No hostile attack developed.

"Yesterday the Royal Flying Corps carried out another long-distance raid, and great damage was done to some railway works and sidings. Several short raids and reconnaissances were undertaken with good results. Hostile aircraft, though fairly active, avoided combat. We drove down one enemy machine and one of ours is missing."

General Headquarters, August 14th, 9.50 p.m.

"Yesterday the Royal Flying Corps carried out much successful work with the artillery and infantry and several bombing raids, including three separate attacks on a hostile aerodrome. One of our machines is missing."

French. *Paris, August 8th. Evening.*

"One of our pilots in the course of a reconnaissance brought down a German machine, which fell in flames in the enemy lines to the north of Auberive. About 9 o'clock last night an enemy aeroplane dropped four bombs on Nancy. Five civilians were wounded, three seriously."

Paris, August 9th. Afternoon.

"One of our pilots pursued a German machine over Lunéville, and forced it to descend in front of our lines. Our artillery destroyed the machine on the ground.

"On the Somme front our airmen fought numerous combats. Six enemy machines, seriously hit, came down suddenly in their lines, and one enemy captive balloon was destroyed.

"During the night of August 8th–9th one of our aeroplanes, with a pilot and bomb-dropper on board, dropped bombs on the powder factory at Rottweil, on the Neckar; 150 kilos. of explosives were dropped on the buildings, where two great fires and several explosions were observed.

"Our airmen, who left at 8.30 p.m., returned at 11.55, after having accomplished in the night a raid of 350 kiloms. (219 miles), rendered particularly difficult by the crossing of the Vosges and Black Forest.

"In addition, during the same night our bombarding squadrons dropped 44 bombs on the stations of Audun-le-Roman, Longuillon and Montmedy, and 66 on the railway at Tergnier and the station at La Serre."

Paris, August 9th. Evening.

"The French machine which bombed the powder factory of Rottweil was flown by Adjutants Buron and Emmanuelli."

Paris, Aug. 10th. Afternoon.

"On the Somme front our aeroplanes fought 15 engagements yesterday. A German machine was brought down between Herly and Rethonvillers. Two other enemy machines were forced to come down after a fight in the region of Combles. Yesterday and last night our air bombing squadrons carried out the following operations:

"Ninety bombs were dropped on the railway stations on the Lassigny-Combles front (Somme), 138 on the railway station of Dugney, 40 on the station of Appilly, 38 on a battery in action in the region of Noyon, 15 on the station of Bazancourt (north-east of Rheims), 92 on the stations of Spincourt and Damvillers and on the surrounding bivouacs (region of Verdun), making in all 413 projectiles."

Paris, Aug. 11th. Afternoon.

"On the night of Aug. 9th–10th our air squadrons bombarded the railway station and barracks of Vouziers and the railway station of Bazancourt."

Paris, Aug. 11th. Evening.

"On Aug. 8th an enemy aeroplane was brought down in flames in our lines to the south of Douaumont by a pilot of the American squadron."

"*Balkans.*—Yesterday evening nine of our aeroplanes dropped bombs on the station at Strumitza, and this morning on 10 enemy camps north of Doiran."

Paris, August 13th. Afternoon.

"The aviator Lenoir yesterday brought down his seventh enemy aeroplane, which fell near Gincrey (Meuse) in the German lines. Last night our bombarding squadrons dropped 120 large bombs on the railway station of Metz-Sablons, the railway workshops and barracks in Metz itself."

Paris, August 14th. Evening.

"Yesterday evening enemy aeroplanes dropped bombs, including several of an incendiary character, on the town of Rheims, while the German batteries were firing on different quarters of the town. The civilian hospital adjoining the St. Remy Church and a dispensary were destroyed. Six civilians were killed."

Russian. *Petrograd, August 9th. Evening.*

"In the region of Friedrichstadt our aviator, Ensign Tisvenko, with an observer, Kondriunakov, undertook a reconnaissance. Notwithstanding the enemy's artillery fire and an attack by a German Albatros, Tisvenko fired at the enemy and, forcing him to flee, continued scouting. Our machine was hit, however, by the enemy's artillery fire, and fell in a burning condition into the enemy's line. The fate of the aviator and his observer is not known."

Petrograd, Aug. 10th. Afternoon.

"On Aug. 9th an aerial fight took place between two of our seaplanes and three enemy seaplanes. Our Lieut. Garkovenko, approaching near to an enemy machine, fired at it with his machine-gun, and forced the German to land on the shore. We suffered no losses or damage."

Petrograd, August 13th. Evening.

"In the region of Novogrudok, Gorodishtche, Stolbcy, enemy aeroplanes flew over our positions. Ten bombs were dropped on the dressing station in the hospital in the village of Adamov (to the west of the town of Mir). A German aeroplane which appeared over the town of Nesvij was attacked in the air by our aviator, Staff Capt. Kruten, and was brought down after a brief fight. The machine and the occupants were captured by us."

Petrograd, August 14th. Afternoon.

"Near the little town of Siniavka, at the Priamur Hospital, two sisters and one hospital orderly were killed and two sisters wounded by a bomb dropped from an enemy aeroplane."

Italian. *Rome, August 8th.*

"Last night one of our airships bombarded the railway junction of Opcina (just north of Trieste, on the supply line to the Isonzo), dropping a ton of high explosive. Good results were observed. In spite of the fire of numerous anti-aircraft batteries and the attack of two hostile seaplanes, the airship returned safely to our lines."

Rome, August 10th.

"A squadron of 18 Caproni aeroplanes, escorted by Nieuport machines, raided the supply stations of Peravacina and Dorberg. More than 3 tons of high explosives were dropped on the railway station and on the military depôts. Good results were observed. Notwithstanding the intense fire of anti-aircraft batteries and the attacks of hostile aeroplanes, one of which was brought down, the squadron returned safely. Hostile aircraft dropped bombs on Venice. Two persons were killed and some damage was done."

Rome, August 11th.

"Enemy aircraft dropped bombs on Venice and on the Grado lagoon. Buildings were damaged, but none was hurt.

"A squadron of our Voisin machines yesterday renewed the bombardment of Prebacina railway station, where material from the lost position was being evacuated. The aviators eluded the fire of the anti-aircraft artillery, and returned safely after dropping 40 bombs on the station, which was completely destroyed.

"The Austrians declare that during the night of Aug. 9th some seaplanes dropped bombs on Venice, aiming at the station, factories, and military establishments. In point of fact, the military establishments and the railway line only sustained negligible damage, and among that inflicted on property having no military importance the most serious is the damage caused to the church of Santa Maria Formosa, which was completely destroyed."

Rome, August 12th.

"Last night enemy aircraft raided Grado. No damage was done to inhabitants or buildings.

"With regard to the air raid on Venice about 10 o'clock on Thursday evening, the Austrian *communiqué* reports that several points of a military character were effectively and certainly struck. As a matter of fact, the bombs thrown only caused small outbreaks of fire in the town, the most important of which was the one which broke out in the dome of the church of San Pietro di Castello.

"The daring raid of our aviators on the torpedo factory at Fiume on August 1st deserves to be noted particularly, because it was one of the most brilliant actions of aerial warfare, and one which caused the enemy very heavy damage in a strictly military sense. As is known, on the sea front of Fiume, three kilometres west of the town, there stand buildings occupied by the Whitehead torpedo and submarine factory, a machine factory, and the Danube Shipbuilding Yard.

"These were the objectives of the raid. The operation was studied with great care, and was accomplished with the customary daring of our airmen. At dawn on August 1st, 19 Caproni machines, escorted by a squadron of Nieuport chasers, left their aerodrome, divided in groups, crossed the Gulf of Trieste, and, flying over the narrow part of the Istrian Peninsula, reached their goal. Having descended to a suitable height, despite the fire of numerous anti-aircraft batteries on the heights around Fiume, from Volosca, and from ships which emerged from the port, our daring aviators dropped 4 tons of explosives on their targets, and returned to their bases undamaged, except one Caproni machine, which landed near Volosca.

"News from a trustworthy source shows that the effects of the raid were terrible. The enormous reservoirs of petroleum on the beach were blown up, and destroyed all the buildings near the torpedo factory, while three sheds were completely ruined, with the complicated and delicate machinery inside them. Less severe—but nevertheless very serious—was the damage done to the Danube Shipbuilding Yard. The impression caused by this raid in Austrian naval and military circles was enormous, as no one expected an attack on such a scale, and so terrible in its effects.

"With the innate barbarity, and in conformity with his savage traditions, the enemy replied to our attack with a bombardment of Venice, aiming, as usual, at buildings of artistic value rather than at military establishments. Happily this double enemy raid only caused two victims."

Rome, August 13th.

"Enemy aircraft last night dropped a large number of bombs on Grado and Campalto, wounding three sailors. One of our small dirigibles was burnt, and some private houses were damaged.

"On Friday the commander of the enemy fleet announced that during the raid on Venice by a squadron of Austrian aeroplanes on the night of August 10th–11th, direct hits were obtained on one of our aviation sheds. This news is absolutely false. Not a single bomb was dropped on the place or in the immediate neighbourhood, and no damage to our aeronautic material therefore is to be deplored."

Rome, August 14th.

"Last night hostile aircraft dropped bombs on Monfalcone and other places on the Lower Isonzo. No damage or casualties are reported."

German. *Berlin, August 8th.*

"A British aeroplane fell into our hands south-east of Cambrai."

Berlin, August 9th.

"The results of aerial fighting during July were: German losses: In air fights, 17; shot down from the ground, 1; missing, 1; total, 19. French and British losses: In air fights, 59; shot down from the ground, 15; by involuntary landings in our lines, 6; in attempts to land spies, 1; total 81, of which 48 are in our possession."

Berlin, August 10th.

"In an aerial fight and by means of anti-aircraft gunfire two enemy aeroplanes were shot down south of Bapaume, and one south of Lille, one near Lens, and one near Saarburg (Lorraine)."

Berlin, August 11th.

"During the night of August 7th–8th, a hostile aviator dropped several bombs on Rottweil, in Wurttemberg. No military damage was caused. One house was hit and several persons were injured.

"The Admiralty Staff announces that a squadron of our seaplanes successfully attacked British monitors and light naval forces off the Flemish coast with bombs on August 9th, and obtained several clearly observed hits. The same day the Russian aeroplane stations of Arensburg and Lebara, on the island of Oesel (Gulf of Riga) were attacked by several German air squadrons, with good results. A number of hits were observed. An aeroplane hangar was badly damaged and the roof collapsed. Of the enemy aeroplanes which ascended to defend the stations one was obliged to descend. In spite of the heavy fire of the British and Russian forces in these engagements, all our aeroplanes returned undamaged."

Berlin, August 12th.

"During the past few days our aerial squadrons have found noteworthy objectives for their activity in the Kovel-Sarny railway line and the extensive troop encampments north of same, on which they have freely dropped bombs. A Russian aeroplane was shot down in an aerial fight north of Sokul."

Berlin, August 13th.

"A British biplane was brought down south-west of Bapaume.

"Lieut. Frankl, who participated in a successful air fight on August 9th south of Bapaume, has received from the Kaiser the Order Pour le Mérite."

Austrian. *Vienna, August 4th.*

"With the army of General-Colonel Tereztyamsky.—One of our aviators brought down an enemy Farman biplane in this region the day before yesterday."

Vienna, August 8th.

"A squadron of seaplanes on Monday night successfully dropped a large number of very heavy, middle-sized and incendiary bombs on the hostile battery positions at the mouth of the Isonzo and the hostile seaplane station of Gorgo. Our seaplanes were violently bombarded, but returned undamaged.

"On August 6th Naval Lieut. Banfield shot down an Italian Caproni aeroplane, after a long aerial fight at an altitude of 2,700 metres above the Gulf of Trieste. The Caproni machine was burned. Lieut. Banfield killed a non-commissioned officer and seriously and slightly wounded respectively the other occupants of the aeroplane."

Vienna, August 10th.

"Last night a seaplane squadron successfully bombarded the enemy seaplane station at Gorgo, near Grado. Several full hits were obtained. In spite of a very heavy bombardment our seaplanes returned safely.

"The visit to Fiume by the Italian large battle-aeroplane on the first of this month was returned by our squadrons, consisting altogether of 21 seaplanes, on the night from the 9th to the 10th inst., by a visit to Venice, where the arsenal, railway station, military objects, and factories were bombarded with ravaging results; 3½ tons of bombs in all were dropped, and about a dozen fires were caused, two of which were of very large dimensions, at the cotton mills in the town, which could still be seen at a distance of 25 miles. The fierce anti-aircraft fire from the enemy batteries was entirely without effect. All our aeroplanes returned unharmed."

Vienna, August 11th.

"During the night from the 10th to 11th inst. our hydroplane squadrons repeated their attack on Venice.

"The arsenal railway station, the outer works, and outer forts were freely bombed. Good results and fires were clearly observed at the arsenal and at the railway establishments, in spite of the thunderstorm which was raging.

"One direct hit was made on the airship shed at Capalto. Further, the batteries in Grado and at the mouth of the Isonzo were successfully bombarded. Notwithstanding very unfavourable weather and the violent anti-aircraft fire of the enemy, all our aeroplanes returned unharmed."

Turkish. *Constantinople, August 8th.*

"One of our airmen on July 24th (Turkish date) forced an enemy aeroplane to descend in the neighbourhood of Muhamadie, and destroyed it. Our aeroplanes successfully pelted with bombs the harbour of Ismailia and buildings there. The enemy cavalry, which on July 22nd (Turkish date) attacked us in the defile of Abudjera, east of Suez, was repulsed after eight hours' battle. Rifles and bayonets were captured.

"Some enemy ships which arrived off Tcheshme, and from which an enemy aeroplane went up and dropped some bombs on the coast, finally all retired in the direction of Chios."

Constantinople, August 10th.

"On July 22nd the enemy lost three aeroplanes in an air fight and by our anti-aircraft guns. In the vicinity of Mohamedie and Romani our air squadron successfully bombed the enemy's camp."

Constantinople, August 14th.

"It has been ascertained that during our last air attack on Suez, apart from other damage caused by our bombs, two petrol stores and one aeroplane shed were destroyed. Three English officers were killed at Ismailia.

From Other Sources.

The *Echo Belge* on August 8th reported that the previous week Mons Station had been bombed by the French.

Mr. G. Ward Price, writing from Salonica on August 6th, says:—

"A German aeroplane which was yesterday flying from the aviation station at Monastir was obliged to come down owing to engine trouble in the Serbian lines. Both airmen were made prisoners."

The *Petit Parisien*, writing on August 8th regarding the situation on the Somme, says:—

"The Germans, plainly disquieted by our bombardment, have attempted numerous aerial reconnaissances, but the enemy airman have been unable to cross our lines."

An Exchange message from Rome on August 8th says:—

"On the night of the 5th and during the 6th Italian torpedo-boats carried out demonstrative actions against the Austrian coast between Duino and Miramare, during which they were attacked by enemy aircraft, which, however, did not cause them any damage."

The Central News correspondent in Paris, writing on August 8th, says:—

"The Germans, for their part, are manifesting signs of the greatest perturbation at the prospect of a renewal of the Allied offensive. Besides endeavouring to reply to the Allied guns, they are seeking by means of their aviators to locate the region of the probable attack, and making an effort to find out where our concentrations are most formidable. The airmen, however, have been unable to perform any useful work owing to the vigilance of their French and British opponents, who effectively maintain the freeway of the air, and have brought down several hostile craft within the last two days."

Mr. W. Beach Thomas, writing to the *Daily Mail* on August 7th, says:—

"One of the most satisfying sights to be found in the ground taken from the enemy is the utter wreckage of one of his batteries—gun, emplacement and surroundings—between Pozières and Contalmaison. It should be left there as a permanent monument to our gunners and our airmen working hand-in-hand.

"This is not, of course, the only such relic. Mametz Wood, to give one instance, still harbours gun wreckage in quantity, but this particular broken battery boasts some spectacular virtues of its own and points the moral of the meaning of a master air service. On occasion when the light was good our airmen have guided the firing at as many as 80 such targets within the day. They have seen in our neighbourhood no fewer than seven gunpits destroyed within the day by our heavy guns, and throughout this offensive their courage, activity and skill in observation have been the chief agent in knocking out one German battery after another.

"Sometimes they are disturbed by other aircraft as well as by Archies. The other day five German planes were seen flying high along the Albert–Baupaume road, where the chief battle was raging. Though still well over German country they were at once challenged and charged by four of our planes and sent helter-skelter. Twice lately along this same road our airmen have swooped down to a few hundred feet and fired their Lewis guns at enemy's transports and moving troops, causing something like a panic.

"During the last week our men have flown to within 20 yards of the enemy's craft in order to make sure of the shot. By such insistence on the offensive they have won the mastery, and the prize of mastery is artillery observation.

"The bombing attacks are more spectacular, especially those delivered against places as far away as Mons. In one of these a train was hit while in motion and broken in pieces During last week such an explosion was caused by one of the hundredweight bombs that the machine, flying at a height of over a mile and a half, was bumped and rocked by the disturbance of the air. And these bombers show the same aggressive fighting quality as the fighters proper. As a rule even when flying 100 miles from their base they swing round their target to see the effect of the shot. Blind work is no good to them.

"Wherever you are along our battle front about the hour of dawn you see and hear our planes shooting out eastwards to bomb or fight or observe. They crowd enemywards like fleets of trawlers seawards; and each day they catch fish: many fish if the air is clear; a few fish if the clouds are low or the 'subsoil' covered with haze.

"Their value to the gunners is altogether beyond estimate—though I must not forget the similar services of that other denizen of the air known as Ruddy Rupert, or the kite balloon. It is, I think, not too much to say that the aeroplane has enabled us to make gunners six months quicker than we could otherwise have made them. Our 'prentice gunners have always given proof of great quickness in learning the arts of laying and fuse-setting; but firing with precision to a map is an art that needs a longer apprenticeship for all men who are not gunners born. Thanks to the airmen, the amount of such blind shooting has been progressively reduced. The 'eyes of the guns' multiply in number and increase in quality of scientific vision."

Mr. Philip Gibbs also deals with the subject in a long despatch which appeared in the *Daily Chronicle* of August 9th as follows:—

"All through the Battle of Picardy most of us have kept glancing up into the sky across the enemy's lines from day to day, and looking for a German aeroplane. It is a rare bird. Now and again when our flying men are not out because the clouds are lying low and it is a 'dud day,' as they call it, a hostile machine sneaks through the mist and drops a few bombs and goes full speed back again; and more often, but not very often, a flight of Germans will come in a gang through a clear sky and attack one or more of our scouts if they can be sure of having all the odds in their favour. Behind their own lines they are more bold (and there is nothing wrong with their courage as individual fighters), and lie in wait in the cross-roads of the air like modern Black Knights (with the Iron Cross as their badge) to defend their territory from all intruders—not, however, with any great success—and so provide exciting combats for our own knights-errant. But across our lines they venture rarely.

"During the first week of the battle, which began on July 1st, the hostile machines were invisible, and yet during all this time of fighting we cannot go up to the lines without seeing our own aeroplanes flying above the shell-fire in German territory.

"The German 'Archies' are firing at them, ringing them round with white puff-clouds, which burst very close, so close that one hold one's breath or speaks a whisper—'They've got him!'—until a second later one can see the aeroplane skimming onwards steadily and quite careless of these explosions which follow on the trail of his wings. Below these flying men of ours shells are crashing and smoke is vomiting up, and villages are burning, and there is all the tumult of battle, but they circle round as aloof as the winged gods themselves, it seems, from all this earthly strife—yet not aloof because they help to direct the thunderbolts, as some of the old gods did.

"So far from prowling on our side of the lines, these pilots and observers make a daily habit of going for far journeys into the enemy's zone, often as far as Bapaume, which is a dozen miles beyond our own trenches, and to places like Martinpuich and Courcelette and Flers. A few days ago they set Martinpuich on fire, and it was still burning when they flew over it again next day.

"On July 28th four of our aeroplanes paid a surprise visit to Mons, the scene of our earliest fighting two years ago, and reminded the enemy of our 'contemptible little army' of those days by flying low and dropping bombs on the rolling-stock in the railway station and upon sheds full of munitions. They were leisurely in their circlings, and stayed until fires had exploded at four different points and much ammunition had been blown up. Then they came home to dinner.

"Every day and all day long they are out and about, across the German lines, observing for our artillery, and directing the fire of our guns upon the enemy's batteries and other targets which they have seen below with their hawk's eyes. This work, so audaciously and skilfully done, has given us an undoubted mastery of observation, which the enemy no longer holds. The German gunners now have to shoot mostly by the map, and although they are very wise in science, it is not the same thing as being able to direct their fire by direct observation of results. Our airmen have been of vast service in the daily battle of guns, and it is largely due to their flights that our artillery has been able to destroy many of the enemy's batteries.

"One day seven batteries reported active by one machine were all silenced in 10 mins., and direct hits were made on five or more batteries.

"On July 28th one of our air squadrons controlled nine direct hits on the enemy's batteries. Those things tell. The knocking out of a German battery means less loss of life to our infantry, and a greater certainty of progress. It is the hardest blow that can be given, for this is a battle of guns, and every battery destroyed is better than the taking of a trench, or at least the easiest way to take it.

"A machine of ours ranged howitzers on a battery of two 5·9 howitzers, which were destroyed, and another machine directed guns on another battery, destroying one emplacement and causing explosions which lasted an hour.

"So the record runs from day to day, and the enemy is getting frightened for his guns and withdrawing some of them at least to safer places.

"The fearlessness of our men is not a virtue with them. It is a natural instinct. They attack unequal odds with the gusto of schoolboys who fling themselves into a football scrimmage.

"Literally the enemy is put to flight by these modern men of ours, as when the other day one of our pilots dived at five hostile machines attacking one of our scouts, and drove them off; and as when, a day or two ago, two others attacked four Fokkers—'the deadly Fokker,' as it used to be called—and drove them down into their own lines.

"They are a new type of men, these pilots and observers of the Royal Flying Corps. It is difficult to place them or to account for them. They seem to have been born to fly. For the most part they are very young men—boys of 19 and 20—though older men twice their age and more are found here and there, having come out of professions like the law and the Civil Service, and taken to the air like ducks to water, but surprised with themselves. The younger men are clean-cut, fine and delicately-made fellows, as far as I know them, rather highly-strung and nervous in temperament.

"It is quite curious that many of them are men of great musical talent. In one squadron I know there are nearly 20 men who are all very full of musical talent. One of them, a stripling, came out of the trenches to volunteer as an airman, with long screeds of music which he had written down 'out of his head,' as children say, without hearing a note of it played until he came back. At night, when dusk creeps through the sky, and one by one the homing birds fly down (there is always an anxious question after the squadron commander, who is the best beloved), the flying men settle round the piano in the aerodrome, and one of them brings out his violin and plays it with a master touch, and another sings in a bass voice that might be heard one day at Covent Garden, and through the evening the men take turns at the piano, to play what comes into their heads and out of their hearts. This link between music and flight may be a coincidence in the case of one squadron (though I have heard of it elsewhere), but it may be that flight is the new music of life, and that the imagination of the younger generation is soaring upon real wings, inspired to flight by the deep chords of emotion that in earlier days went into sound and colour. The pity is that just now they are instruments of death.

"They have amazing adventures up there in the sky, and learn strange things. They learn the look of the great country below, so that every landmark is familiar to them, and any strange flash or shape is detected at once, and those things they must learn in three different scales of light, morning, afternoon and evening, because at each of those times the landscape and the shape and shadows of it are quite different. They fly above the bursting shells and the tumult of war, but hear nothing of it unless they come down very low, for the humming of their engine is a great song in their ears. But they hear the 'Archies,' which make the puff-clouds above them, and sometimes, but not often, the scream of great shells going by them. A friend of mine had a queer and frightful case of this not long ago. He was flying fairly low when he saw coming straight for him three-quarters of a ton of metal, in the shape of a shell, and heard its whining note, and was tossed, as though in a rough sea, by the rush of the wind it made. It was a shell from one of our 15-in. Grannies, and this pilot who met it on its way within 100 yards was annoyed for the moment with the gunners below who had not worried about the bird in the sky, which was my friend.

"They are humorous, keen, sensitive men, these air pilots of ours, and though some of them are very musical, they do not disdain other joys of life, like a good dinner in some good dining place behind the lines, when a 'dud day' makes flying 'off.' And for some of us, not of the air, it is better than a banquet to see these flying men and to hear them building castles in the air, and telling tales more wonderful than those of fairy lore."

The *Telegraaf* on August 9th gave a report from its correspondent on the frontier that 11 British and French airmen flew over central and south Belgium on the previous Saturday, Sunday and Monday, and threw bombs with good effect on German military works. It is stated that the German anti-aircraft guns bombarded the airmen without result. A great fire is said to have broken out in the German magazines at Aerschot, in Belgium, but details are lacking.

The *Maasbode* on August 9th published a telegram from Maastricht reporting that the French airmen who threw bombs on Metz hit the station and destroyed 10 houses in one street containing the barracks. Two Landsturmers were killed on the railway Metz-Thionville, while great damage was done to a fort near Metz, 200 soldiers being killed or wounded.

United States Anti-Aircraft Guns.

AFTER three years experimenting the U.S. Bureau of Ordnance has produced an anti-aircraft weapon which, according to the Washington correspondent of the *New York World*, is a machine rifle about 50 calibres long, capable of throwing a 3-in. shell 27,000 ft. at an angle of 90 degs. It can also deliver its charge at rapid fire rate. These guns have already been fitted on the battleships "Pennsylvania" and "Nevada," and 18 other battleships and cruisers are to be equipped with them, two guns on each vessel. They will be mounted fore and aft on the rear stands of the gun turrets.

The First Hydro-aeroplane in the States.

THE District Supreme Court of New York has just reversed a decision of the U.S. Commissioner of Patents, and decided that priority of invention of the hydro-aeroplane in the U.S. belongs to Albert S. Janin, who produced a device for the purpose in 1909, about a year ahead of Glenn H. Curtiss, who experimented in this direction at Hammondsport in 1910.

More Squeals from the Boche.

THERE are abundant proofs that the Boche does not like the medicine made to his own prescription. Another instance emanates from the headquarters of the Seventh Army Corps at Maintz in the form of a proclamation to farmers. This says:—

"We learn from a reliable source that an Anglo-French Flying Corps is being formed for the purpose of dropping a special kind of fire bomb on our fields as soon as our harvest is ripe and dry weather has prevailed for some time, in order to destroy our crops."

Instructions have been issued confidentially to the farmers as to means of defence.

The *Frankischer Kurier* says that the British and French flying men have already attempted to destroy the Bulgarian crops in the same way.

Another Raid Fable.

THE following story, officially sent out from Berlin on August 12th, is so patently a fable that it scarcely needs the Official Press Bureau's footnote to the effect that "this German report is wholly untrue":—

"Contrary to the assertions of the British Government, the general conviction reigns in London that the attack on August 1st was the most serious which London has ever been through up to the present. Undeniable reports regarding the airship attack of July 28th–29th, July 31st, and Aug. 1st and Aug. 2nd–3rd, confirm that very heavy damage was caused. A hall, which was under construction, with a remount depôt, was completely destroyed. Most of the horses perished.

"At the mouth of the Humber a lighthouse was destroyed. A small cruiser with three funnels and one mast was badly damaged. Below Grimsby two munition sheds were completely destroyed. Ships anchored between Grimsby and Cleethorpes Harbour establishments and in the neighbourhood of Cleethorpes were seriously damaged.

"The damage caused in Hull amounts to millions. Several arms and munition works were destroyed, as well as other establishments of military importance. A panic broke out amongst the population when they realised that the anti-aircraft guns could do nothing against the airships. The Harbour of Immingham has been closed on account of the extensive damage caused in the docks and the coal depôts.

"In the region of Norwich there were several cases of destruction on the railways. To the south of Cambridge a large factory was set on fire. Near Yarmouth a battery of searchlights and anti-aircraft guns was destroyed. In Harwich an airship shed in course of construction was brought down. In Dover the docks were bombarded for half an hour and fires were observed there. Woolwich and the surrounding districts were seriously damaged and several munition factories were hit. In the eastern suburb of London a cotton mill used for the manufacture of shell cases was completely destroyed. Over a 1,000 men and women have been put out of employment.

"Several large bridges across the Thames, including the footbridges of the Tower Bridge, were damaged. In the docks several warehouses and landing piers were destroyed. Ships anchored there were partly seriously damaged. In one dock numerous ships, including a large English steamer, which were supposed to take provisions to France to the troops, were destroyed by fire. Many persons were wounded, some seriously, by the anti-aircraft fire. In the Thames a torpedo-boat was hit by our bombs and sank. In Oxted, near London, two munition factories were destroyed. The surroundings of the factories were still on fire the next day."

An Echo of Kut.

AN indication as to the whereabouts of some of those who were taken prisoners at Kut is afforded by a message which has been received at Dorchester by the parents of Air-Mechanic S. J. Wells, R.F.C. He says he is at Angona (Asiatic Turkey), and is quite well and comfortable.

Zeppelins and Ships.

THE Danish *Politiken* reports that the Swedish steamer "Norrland" was attacked last week by a Zeppelin near the Dogger Bank; 30 bombs were thrown, but the steamer escaped with slight damage.

Another Zeppelin Reported Down.

A MESSAGE from the frontier to the *Telegraaf* reports that on August 10th a heavily damaged Zeppelin coming from the West landed in Belgium.

Count Zeppelin's Night Out.

ACCORDING to the Stockholm *Tidningen*, which seems to have heard it from Berlin, Count Zeppelin was on board one of the raiders during the visit to England on August 8th–9th; but we doubt it.

Zeppelin Raids.

SIR E. CORNWALL, in the House of Commons last week, asked the Secretary of State for War whether he proposes to make a statement with regard to the recent Zeppelin raids, whether he will state how many hours they were actually over this country in their recent visits, and at what stage of the attack does the responsibility for the defence fall upon the War Office?

Major Baird: It would not be in the public interest to add to the information already published regarding recent hostile air raids. As regards the last part of the question, the responsibility for dealing with air raiders rests with the Navy, while they are over the sea, and with the Commander-in-Chief Home Forces as soon as they cross the coast line. It is scarcely necessary to add, however, that there is close co-operation between the Royal Naval Air Service and the Royal Flying Corps, and that in practice both Services seize any opportunity of attacking the enemy whether he is over the land or over the sea.

The Zeppelin Liners.

ENVY aroused by the crossing of the Atlantic by submarine has possibly again stirred up the Zeppelin liner idea. At any rate the Berlin correspondent of the Dutch *Tyd* telegraphs a story that a few months will see Zeppelin liners crossing the Atlantic. Trial flights of Zeppelins built for this purpose are said to have already been made over the Lake of Constance, and Count Zeppelin is credited with recently piloting one to the English coast. Their maximum speed, the correspondent adds, is 200 kiloms. (about 125 miles) an hour, and they are able to fly at such a height that no enemy air attack against them will be possible.

Last Messages from "L 19."

THE Gothenburg *Handelstidende* states that recently fishermen at Marstrand picked up a bottle containing a despatch from Commander Lowes of the wrecked Zeppelin "L 19" (which came to grief some time ago) to his superior officer, in which he says:—

"With fifteen men on the platform and no gondola, 'L 19' is going very slowly. I am unable to save the airship. In foggy weather, we, on our return from England, passed Holland, and were bombarded by Dutch sentinels. At the same moment three motors failed. 1 p.m." The bottle also contained fifteen letters from the crew of the "L 19" to their relatives.

German Seaplanes and Roumania.

COMING from the direction of Varna, three German seaplanes on August 11th flew over the town and harbour of Constantza. At a height of 3,000 ft. they flew along the coast for some distance evidently spying out the land. The lighthouse keeper of Tuzla reported that one seaplane released a small balloon, which fell in the sea. The inhabitants were greatly alarmed.

Don't Like their Own Medicine.

A MESSAGE from Zurich suggests that the real reason why the Wurtemberg Royal Family and Court have recently sought a change of air at Friedrichshafen is that they fear French aviators may again attack Stuttgart, while the recent rioting among the discontented populace has not made the locality a particularly healthy one for Royalty.

Lord Kitchener's Letter.

It was a happy idea to publish facsimiles of Lord Kitchener's now famous letter, the original of which, it will be remembered, was purchased by Mr. Fenwick Harrison for £6,000 (which sum went to the British Red Cross Society) and then presented to the Nation. The sale proceeds of these facsimiles will be passed into selected war charitable objects. To Messrs. Raphael Tuck and Sons, Ltd., has been entrusted the work of reproduction, and right splendidly have they carried out their part of the bargain. The result is a series of striking and artistic souvenirs of the late War Minister is reproduced, by special permission of the War Office, on the official letter paper of the Secretary of State for War, and is in every respect identical with the original appeal. It is placed in a cover designed by Mr. Frank Brangwyn, A.R.A., and Sir Arthur Conan Doyle has written an appropriate monograph, while a tribute to the late War Minister's work is paid by Sir George Arthur, who was Lord Kitchener's private secretary.

The facsimile is being issued in three editions—in khaki cover, 1*s*. net; in white Whatman cover, 2*s*. 6*d*. net; and a photogravure, 10*s*. 6*d*. net. A publisher's proof edition of the photogravure, signed and stamped, will be issued at £1 1*s*. net, and there will be a limited issue of an artist's proof edition, signed by Mr. Brangwyn, the price of which will be £2 2*s*.

Everyone should secure a specimen of this letter as a reminder of a great man and his work. At the same time there is the further satisfaction in knowing that one is helping forward the deserving cause of our heroes.

Aviation Equipment.

No better summary could be given than these two words to the power to fill by Dunhill's, Ltd., every aviatic requirement outside the machine itself and its accessories. After a run through the Conduit Street establishment of the firm, the only query is how to choose from so extensive a stock of aviation clothing as is there assembled on view. And when you have secured what you really must have there and then, you will find there were still one or two items which, after all, you had been wise in including in the list of necessities. Very handy, therefore, is the new catalogue just issned by the firm, in which can be found in detail and illustrated very convincingly the more prominent features of which Messrs. Dunhill's, Ltd., make a speciality. A word of advice to those who from stress of circumstances cannot call personally. Write to 2, Conduit Street, for the booklet, or 'phone them Gerrard 3859.

The Curtiss-Wright Amalgamation.

The negotiations which have been going on with regard to an amalgamation of the Curtiss and Wright interests in the States appear to have come to a standstill for the present. Apparently there is some difficulty with regard to the calculation of asset values, mainly on account of uncompleted contracts with European Governments. The matter is therefore to remain in abeyance until it is possible to make accurate estimates of values.

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Another useful clip for match-boxes is to hand. This one is from the C.A.V. Company, and bears on one side a miniature of Val Prince's striking C.A.V. poster, and on the other the Allies' flags.

— — —

Those who take an interest in tyre economy will welcome the new hand-book on vulcanising and the care of tyres which has been put out by Messrs. Harvey Frost and Co. It costs 1*s*. (post free 1*s*. 2*d*.), and can be had from their West End Office, 27, Charing Cross Road, W.C.

— — —

It is two years since Messrs. Brown Brothers last issued their catalogue of accessories, components and tools, and doubtless on that account alone there will be a rush to secure copies of the 1916 edition, which is just out. The book runs to just on 600 pages, and it is well bound, so that it will stand the constant reference which it is certain to get, for there are few things which are not to be found therein. The various sections, such as accessories, tools, clothing, &c., are thumb-indexed, which makes for convenience. Send to Great Eastern Street for a copy.

— — —

The Wright Company advise us that an error crept into the specification which they sent us of their new military tractor biplane, described in "Flight" last week. The slow flying figure should have read 35 miles and not 25 miles an hour.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly, Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park & District (66, South View Rd., Hornsey)

Monthly Report.—July saw some of the best flying that has ever been done by this club, despite the fact that the attendances have been somewhat small. The tractor monoplanes belonging to Messrs. E. Coleman and F. E. Rayner have both accomplished quarter-mile flights with a duration of between 40 and 50 seconds. On July 1st, at Parliament Hill, there was not much flying owing to the extremely high wind which prevailed. July 8th was a splendid flying day. Mr. Rayner's new Morane tractor was at work consistently throughout the afternoon with good durations. A twin-screw canard model was being flown by Mr. Coleman, but not being satisfied with its performances, he converted it into a tractor, and in this form it flew really well, reaching an altitude estimated at about 150 ft. A small high-speed mono. was flown by Mr. W. Hardinge. On the 15th, Mr. A. Richards was testing a hollow-spar machine with good results. Messrs. Rayner and Coleman were doing several quarter-miles, their machines rising to a great height, and the flights terminating with long flat glides with propeller stationary. Mr. Hardinge's small tractor was making a feature of r.o.g. flights. Mr. Coleman's hollow-spar tractor monoplane was the only machine out on 22nd, when it made several flights which exceeded quarter-mile, witnessed by Mr. B. Tear (late secretary of Liverpool Aero Research Club). On July 29th, Messrs. Coleman and Rayner were again the only members present. Their models made several fine flights of about 400 yards at an average altitude of 150 ft. These two machines are very similar in flight, and both terminated their flights with motor completely "run out." Several very realistic flights were made off the ground, rising off in a little more than their own length. Mr. A. S. Whiffin, of Bromley, visited the club and flew a small tractor mono., which, after a few minor adjustments had been made, gave good results. Owing to the development of long-distance models it has been found necessary to do most of the flying at Parliament Hill (Hampstead Heath), and Finsbury Park will be used only for testing models where comparatively short flights are desirable.

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Another Aeroplane from Australia.

It has been announced in Sydney that Mr. Kidman, the wealthy stock owner, has presented an armoured aeroplane costing £2,700 to the Imperial Government.

An Aeroplane from Fiji.

The natives of the Province of Rewa, Fiji, have offered £1,500 for the purchase of an aeroplane. This patriotic offer has been gratefully accepted, and the thanks of the Army Council have been communicated to the chiefs of the province

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PUBLICATIONS RECEIVED.

Gas, Oil and Petrol Engines. By A. Garrard. London: Whittaker and Co. Price 5*s*. net.

The Motorists' Handbook on Vulcanising and the Care of Tyres. London: Harvey Frost and Co., Ltd., 39–41, Great Eastern Street, E.C. Price 1*s*.

Catalogue.

Accessories, Motor Tyres, Motor Clothing, &c., Tools. London: Brown Brothers, Ltd., 22 to 34, Great Eastern Street, E.C.

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Aeronautical Patents Published.

Applied for in 1915.

Published August 17th, 1916.

8,845. W. Cunningham. Aeroplanes.
10,255. Sperry Gyroscope Co. Gyroscopic stabilisers.

Applied for in 1916.

The numbers in brackets are those under which the specification will be printed and abridged, &c.

Published August 10th, 1916

171. A. V. Roe. Tilting mechanism for tail planes of aerial craft. (100,875.)

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[Owing to the enormous pressure on our space we have had to hold over the annual report of the Advisory Committee for Aeronautics and several other regular features.—Ed.].

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TO OUR READERS.

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As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

The Air Committee's Report.

LAST week the publication of the interim report of the Air Committee, in regard to their investigation into the charges brought by Mr. Pemberton Billing against the administration of the Air Services, was just in time to be reproduced in the pages of "FLIGHT." Comment had necessarily to be suspended at so late an hour when going to Press. Taken as a whole, the conclusions come to are exactly what might have been expected by ninety-nine out of a hundred sane men, who have followed the politics of Aviation. Although Mr. Billing still persists in aggressively declining to withdraw a single point of his original charges, we can nevertheless detect in this refusal a very clear indication of a desire—as we said long ago he would—to get clear of the "murder" portion of his parliamentary utterances. At least that is the only possible meaning to be evolved from the statement in his "reply to the Air Committee's report," which he contributed exclusively (we wonder why) to *Reynolds'* newspaper of last Sunday, to the following effect:—

"I am certain that the reforms and improvements which have been made during the last six months would never have been effected, or even attempted, *if I had not employed what I am prepared to admit was dramatic rhetoric*, to force the hands of the Government, and to rivet their attention to the fact that some of our finest men were daily sacrificing their lives for want of intelligent direction.

"Let it be understood: Despite the findings of the Committee, I neither qualify nor withdraw the statements I have made, or the charges I have brought."

It is as well to have this admission on record, as it disposes at once of the unwarranted charge against the Administrative Heads of the Air Services. We differ from Mr. Billing, as we have all along, in his assumption that he would not have obtained a hearing for his demand for an investigation into the affairs of the Air Services, except by his aggressive and highly unseemly tactics. That there was room for improvement in the Services, there has been no manner of doubt for some time past, and nobody knew this better than those responsible for the executive side of the Services. Reform and reorganisation had long before been initiated by the responsible heads, and it must have been well known to Mr. Billing, that so far as the main items of his complaints were concerned, they referred to "back numbers" already out of date, and well on the way of being, if not already, remedied. Therefore we repeat once more that in our opinion the tactics adopted almost immediately after his *début* in the House, have not borne the fruit which might have been hoped for, when Mr. Billing was returned by East Herts to Parliament, as the representative of Airism. No man probably had a greater chance of making good than had "P.B." when he started his parliamentary career. He not only had a good cause to champion, but a great one, one which should have been far removed from the surroundings of hysteria. Presumably the only justification—if anything can justify such tactics—from a parliamentary standpoint is to be found in the necessity of going one better than members who had previously, for their own ends, endeavoured to "gas" the House on the Air Question. It appears to have been a case of which should shriek the loudest, and there is not much doubt as to which succeeded.

There was no partial eclipse about the result—it was total eclipse indeed, and since it has not even been a case of "also ran" with "t'others." They have just quietly faded away from the limelight, so far as Air politics are concerned. That the advent of Mr. Billing in the House, and the work he put in during his first and second candidature campaigns, hastened the process, which was already in being, of reorganising the Air Services, we verily believe, and this will stand to his credit in the days to come. But we can only regret that his methods otherwise should have so entirely estranged the major part of the House and the public from him as to largely discount any good to the aircraft industry which all hoped would accrue from having a live and practical advocate in Parliament to watch over the interests of those concerned in this great revolution in the world's affairs.

The Air Committee's interim report, as they clearly state, has been issued comparatively promptly, in order that the criminal negligence charges against the officials and officers responsible for the administration and command of the R.F.C. may be at once negatived. That men like General Sir David Henderson should be officially vindicated was hardly necessary for those who know them. But members of the general public, who are not so fortunately placed, are only too apt to absorb charges and accept them as proven, until some counter-statement is forthcoming. And from that point of view, it was imperative that this most unpleasant position should not be allowed to remain, until such time as the Committee's full report is available. Therefore we welcome this interim statement, which entirely exonerates the higher commands of the Air Services from the slightest suspicion of being guilty of so heinous a crime as that alleged by their accuser. The details of the report, as they appeared in last week's issue of "FLIGHT," speak for themselves, and we think that, in spite of Mr. Billing's "reply" in *Reynolds'*, the conclusions come to by the Committee are, in the main, a fair reflection of the facts as they are set forth. We are not suggesting that there are not weak links in the armour, so far as want of judgment is apparent by individuals immediately concerned, but this if anything rather emphasises than the reverse the absence of justification with which the original charges were made.

By way of conclusion, the pity of it all is that in "P.B." the industry, under more favourable auspices than he has hitherto appeared, should have a valuable asset, and we are not in the least surprised at the statement in the report to the effect that "the Committee think it right to say that Mr. Pemberton Billing made other criticisms" (other than the "murder" charges) "and suggestions of a totally different character. Some of these deserve and will receive careful consideration."

Constructive criticism is always welcome, when directed in a proper channel and in a spirit of helpfulness. Destructive criticism is no doubt a good deal easier, especially when it is of the "Phwat's the law and who're the bosses, I'm agin the lot" sort of attitude. That "P.B." is so well stocked with the former, that there is no necessity for him, and he should never allow himself, to be lured into the latter quagmire of mistaken policy, we verily believe. This, reading between the lines of the report, would appear to be also the opinion of the Committee, as in addition to the quotation already referred to from the report, the Committee say in their summing up :—"Flying, even at home, is at present attended with considerable danger. It is imperative that every precaution should be taken to reduce that danger to a minimum. No one could complain if Mr. Billing had asked that these cases should be inquired into to ascertain whether the deaths of the men might have been prevented, but to base upon these accidents, charges of criminal negligence or murder is an abuse of language and entirely unjustifiable."

It would be difficult, we think, to find anyone to disagree with the spirit of this conclusion, and if Mr. Billing will only follow the hint so clearly expressed in the words, in his future procedure, there may be hope of his rehabilitating himself in the good opinion of those who condemn and have no sympathy with his offensive and unconvincing methods.

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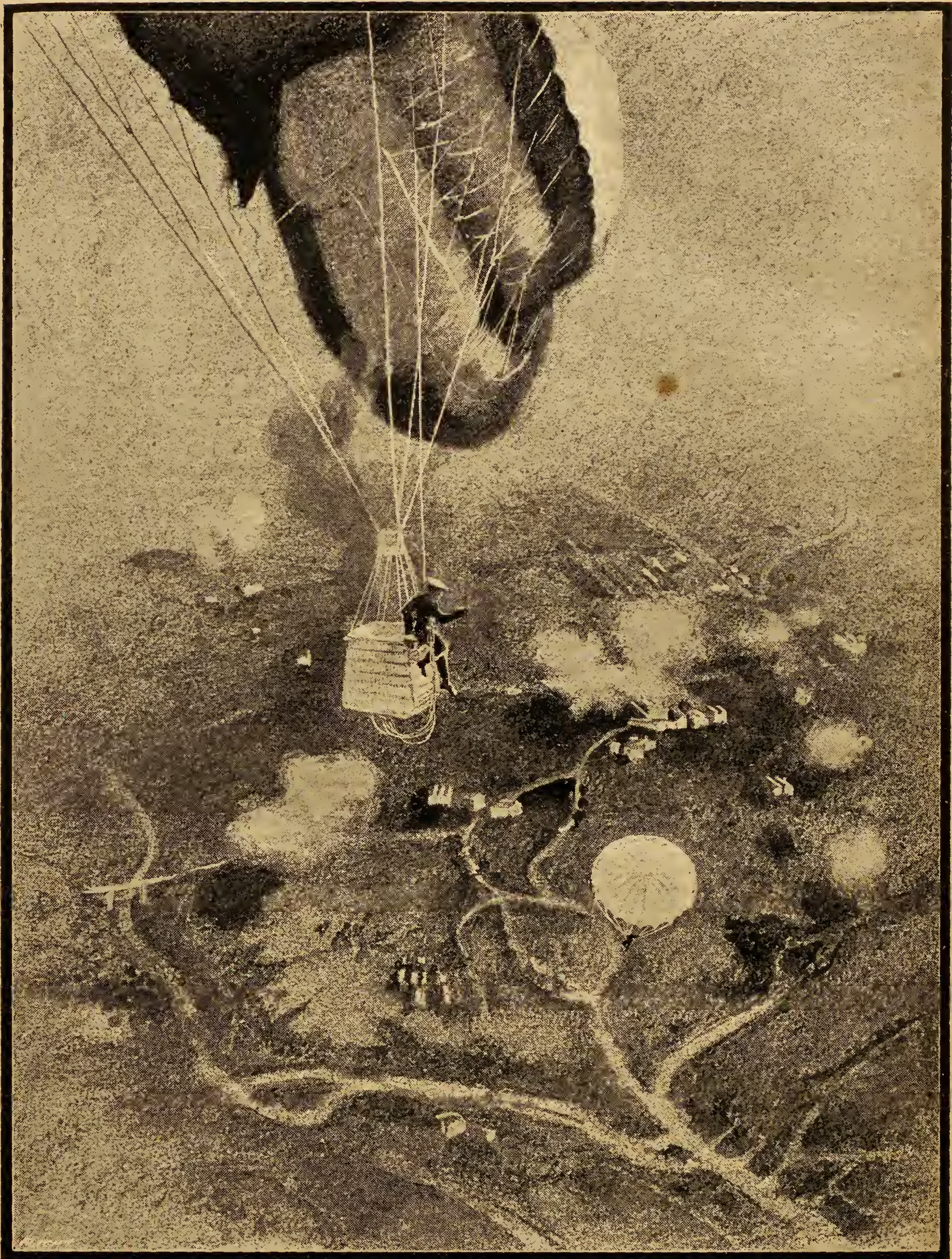
"Answers to Correspondents."

From several correspondents for some time past communications have reached us suggesting we should resume our "Answers to Correspondents" column, so that readers may be able to obtain through it solutions to any queries they may have, and also, where the matter lends itself to general treatment, glean knowledge from the replies to others. We have, therefore, decided to accede to the general desire expressed, as although much of the information given may be of a more or less elementary character, there are now such a number of new recruits coming into the art, this should prove—where the subject-matter of a correspondent lends itself to a useful answer—helpful to many who may have had a similar doubt, unexpressed, in their minds. Where a query is of sufficient general interest, our idea will be therefore to more or less preface the answer with the point raised, so that other readers may follow the particular point which is dealt with. Others of a more personal character naturally will carry no interest with them except to



ALL IN THE DAY'S WORK OF THE OBSERVATION BALLOONS AT THE FRONT.—An incident which obtained the D.S.O. for Second Lieutenant A. G. D. Gavin, R. Highrs., Special Reserve and R.F.C., "For conspicuous presence of mind and unselfish courage. When his balloon broke loose and drifted fast towards the enemy's lines, he instructed his passenger in the use of the parachute and helped him out of the basket. He then destroyed all his papers, and descended by his own parachute, landing under machine-gun fire close to the trenches. His passenger also landed safely."

the person concerned, and these therefore will be brief and probably unintelligible to others, as is usual in the answers column. We shall allow time to decide whether this "revival" will justify its existence and the space it occupies.

* * *

The Antics of the German High Sea Fleet.

"Ha, Ha!" laughed the fleet-footed coward-bully, "I made 'em run—but they never caught me." No better application of this old-time touch of area-sneak methods could be found than its employment as an illustration of the "In and Out" of port cruises of the German "Navee." The German High Command has made much to do as to the British Navy hiding for the past two years. And they are quite right, for that is just what it has been doing—hiding, so that the German fleet may not know where our ships are placed until too late for the bold Kiel buccaneers to scuttle back to their mine-fields without a real test of strength with Jellicoe's little collection of above-water craft. So it happened again last week that they were able to reach home intact, however much they may have felt humiliated by having to show such a clean pair of heels to our battleships, simply by reason of the one great asset which the Germans possess over us: their Zeppelin eyes of the fleet. As it stands at present, it is more like a game of blind man's buff in which Britain is blind man *all the time*. How the handicap works, against our chances of being able to get to grips with the German ships, guarded as they are by their Zepp. scouts, is well illustrated during an article, upon the latest German scuttle, in the *Daily Telegraph*, by Leonard Spray—a good name for sea journalistic work. He puts it this way from evidence he has collated:—

> "At 9 o'clock in the morning the Great German Fleet, at least 60 vessels of all descriptions, was sighted.
>
> "It was carefully guided by three Zeppelins. At 6 o'clock in the evening the same fleet was viewed further north, and this time, with its attendant airships, was steaming furiously eastwards. What had happened in the meantime? This, too, is equally clear from reports of other Dutch captains. At 5 o'clock in the afternoon they saw one or more British squadrons much further south than the 6 o'clock position of the German fleet heading almost due north in the direction of the enemy. Something else they noted. From the northwards appeared three Zeppelins. The airships, immediately on spotting the British vessels, went about in the direction of the main German fleet. Then came a swift dash. Half an hour afterwards the High Canal Fleet was in mad retreat to its home bases.
>
> "That was the last seen of any German warship in the North Sea. . . . At 6 o'clock the German fleet disappeared, whilst for hours afterwards the British squadrons were sighted, searching for the battle which the German admirals were so careful to avoid. Into the hours of darkness the British pursued hope of contest. No possible chance to bring the enemy to that contest was missed, but, alas! in vain, for equally—and even to a superior extent—no chance that the contest should take place was risked by the Kaiser's admirals. After their Zeppelins had reported the presence of great British forces they devoted all their abilities to escape meeting with the Fleet which they were boasting a few weeks ago they had smashed."

We don't want to rub it in, but we are looking forward with considerable interest to the day when our own fleet will be able to get a little helpful advice from above as to the direction to take so as to avoid the German High Sea Fleet masqueraders, until Jellicoe has managed to manœuvre well behind the wash of the German battleships. Then—well, may we not have much longer to wait for the chance our men, high and low, are seeking.

* * *

And the Air Raids.

Taking the German Navy tactics in conjunction with the recent 20,000 ft.-high visits of their Zeppelins over the British coast line, there appears to be a common ground for action just now between these two phenomena. They both hang together, it appears to us, and spell practically but one idea—the administration of the tonic necessary to impart a fillip to the German peoples' halting doubts as to that great and crushing victory for the Central Powers—*and* that new big German loan which is due, as it can no longer be postponed, next month. Else why all the wonderful fairy tales as to the results of these excursions, fairy tales which outclass Baron Munchausen altogether, even in his most imaginative moments. Either some pastmaster in the art of lying is deliberately and officially concocting these tales for a specific purpose, as is highly probable, or the Zepp. pilots themselves are arch liars, pulling the leg of the German High Command. Either way, the alternative does not induce much respect for our clever, if over-cunning enemies. The Allies' reply to these raids was quickly forthcoming in our raids on the military centres of the German Army, and in the very effective air-work by our French comrades in arms.

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New Rank in the R.N.A.S.

AN Order in Council, dated August 18th, provides that candidates on appointment to the Royal Naval Air Service are to be designated probationary flight officers, which title they will retain until qualified as flight sub-lieutenant. The Order establishes the rank of probationary flight officer.

The Work of the R.F.C.

IN the despatch, published in the *London Gazette* on August 21st, from Viscount French covering the operations in France between October 15th and December 19th, there is the following reference to aircraft work:—

> "On November 25th the Royal Flying Corps carried out an effective raid on the enemy's cantonments at Achiet Le Grand, and this was followed a few days later by a similar raid on Don Station and the adjoining stores, in the course of which several fires and an explosion were observed.
>
> "Another air raid against the quay and stores near Miraumont was also reported as having been effective on November 30th."

The Supply of Munitions.

IN his speech in the House of Commons on August 15th the Minister of Munitions (Mr. Montagu) said that Gen. Jacquot spoke very highly of our new anti-aircraft guns.

He also said, with regard to the artillery in the field, that the demand was ever for increasing range, as the value of long range fire became more apparent when combined with good aerial observation. The Ministry of Munitions had not been unmindful of this tendency in the past, and was keeping moving with the times.

Later in the debate which followed Dr. Addison, in reply to questions, stated that the Ministry of Munitions have nothing whatever to do with the supply of aeroplanes.

No Sirens After Dark.

NOTICE has been received by police authorities in the Midlands from the Home Office prohibiting the sounding of sirens or buzzers in the case of air raids between one and a half hour after sunset and one and a half hour before sunrise.

The order states that the decision is by direction of the competent military authority, and applies to an area which includes Birmingham, Walsall, Dudley, West Bromwich, Wolverhampton, Wednesbury, Sutton Coldfield and other places.

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of August 17th :—

Temporary commissions have been granted to the following, seniority Aug. 16th :—Lieutenant (R.N.V.R.) : G. P. Robertson. Sub-Lieutenants (R.N.V.R.) : E. P. Rydings, J. D. Fry, A. S. M. Monteath, F. W. Newman and G. E. Thomas.

The following appeared among the Admiralty announcements of August 19th :—

R. W. Springfield granted a temporary commission as Sub-Lieutenant, R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to dated Aug. 27th.

The following appeared among the Admiralty announcements of August 21st :—

Staff-Surgeon G. D. Bateman to the "President," additional, for R.N.A.S., to date Aug. 20th.

G. H. Snider, entered as Probationary Flight Sub-Lieutenant for temporary service, to date Aug. 27th.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of August 15th :—

Park Commander.—Lieut. (Temporary Capt.) M. Spicer, North'n R., from an Equipment Officer, and to be Temporary Major whilst so employed ; Aug. 1st, 1916.

Flight-Commanders.—Temporary Second Lieut. F. W. Honnet, General List, from a Flying Officer, and to be Temporary Captain whilst so employed ; July 30th, 1916. Aug. 1st, 1916 : Capt. G. R. Howard, D.S.O., Essex R., Special Reserve, from a Flying Officer ; Temporary Capt. W. Lambert, General List, from a Balloon Officer.

Equipment Officers.—Second Lieut. C. E. Robertson, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed ; June 1st, 1916. Second Lieut. F. H. Songhurst, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed ; July 21st, 1916. Aug. 1st, 1916 : Capt. P. R. Grace, Special Reserve, from a Staff Captain. Qr.-Mr. and Hon. Lieut. W. J. Waddington, R.F.C., from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed.

Flying Officers.—Second Lieut. R. H. Edwards, Special Reserve ; July 18th, 1916. Temporary Second Lieut. F. L. Osman, General List ; July 19th, 1916. July 20th, 1916 : Lieut. C. I. Jameson, 43rd Canadian Inf. Bn. ; Temporary Second Lieut. K. M. St. C. G. Leask, Devon R., and to be transferred to the General List ; Second Lieut. R. E. Meek, Wilts. R., Special Reserve, and to be seconded ; Temporary Second Lieut. E. H. Russell, E. York. R., and to be transferred to the General List ; Second Lieut. C. L. S. Thomas, Bord. R., and to be seconded ; Temporary Second Lieut. J. Kerr, Gord. Highrs., and to be transferred to the General List ; Second Lieut. W. M. Carlyle, Special Reserve ; Second Lieut. S. W. Carline, Special Reserve.

Adjutants.—Temporary Capt. J. H. S. Annesley, General List ; June 25th, 1916. Capt. W. H. C. Ramsden, E. York. R., and to be seconded, vice Major A. F. S. Leggatt, R. Scots ; June 26th, 1916. Temporary Capt. G. C. Anne, York. L.I. (T.F.), vice Lieut. (Temporary Capt.) A. McR. Moffat, Arg. and Suth'd Highrs. (T.F.) ; July 14th, 1916. Temporary Lieut. D. L. Cox, General List, vice Capt. C. F. Gordon, N. Staff. R. ; July 27th, 1916. Capt. M. Nicholson, N. Midland Brig., R.F.A. (T.F.) ; Aug. 1st, 1916.

Assistant Equipment Officer.—Temporary Capt. R. F. Stapleton-Cotton, A.S.C., and to be transferred to the General List ; July 29th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 16th :—

Flying Officers (Observers).—July 28th, 1916 : Lieut. J. S. de L. Bush, Som. L.I., Special Reserve, and to be seconded ; Temporary Lieut. E. D. Messervy, Lond. R. (T.F.) ; Lieut. L. Drummond, Can. Eng. ; Second Lieut. (on probation) C. J. Pile, R.F.A., Special Reserve ; Temporary Second Lieut. J. Edwards, General List ; Temporary Second Lieut. G. T. Richardson, General List. July 30th, 1916 : Temporary Lieut. F. G. Pearson, R. Fus., and to be transferred to the General List ; Temporary Second Lieut. W. E. G. Bryant, R. Fus., and to be transferred to the General List. July 31st, 1916 : Temporary Capt. R. D. Simpson, A.S.C., and to be transferred to the General List ; Temporary Lieut. T. L. W. Stallibrass, attd. 9th Hodson's Horse, Ind. Army ; Second Lieut. H. Tatton, D. of Lancaster's Own Yeo. (T.F.) ; Temporary Second Lieut. A. E. Wynn, General List. Aug. 1st, 1916 : Lieut. S. H. Clarke, Wilts. R., Special Reserve, and to be seconded ; Second Lieut. C. P. F. Lowson, Rif. Brig.

Memoranda.—Temporary Second Lieut. G. H. Padley is transferred to the General List, and to be Temporary Lieutenant whilst employed with the R.F.C. ; Nov. 6th, 1915.

Acting Sergt.-Major S. Mills, from R.F.C., to be Temporary Second Lieutenant for duty with the Military Wing of that Corps ; July 30th, 1916.

To be Temporary Second Lieutenants for duty with R.F.C. —Aug. 5th, 1916 : Corpl. P. C. E. Johnson, from Haileybury Coll. O.T.C. ; Cadet Corpl. J. F. Duff, from Winchester Coll. O.T.C. ; Sergt. C. O. B. Beale, from Haileybury Coll. O.T.C. ; Sergt. R. S. Asher, from Winchester Coll. O.T.C. Aug. 8th, 1916 : Pte. B. E. D. Broughton, from Inns of Court O.T.C. ; Staff-Sergt. L. G. Bacon, from 4th Hamps. R. (T.F.) ; Leading Mechanic J. Southall, from R.N.A.S.

The following appeared in a supplement to the *London Gazette* issued on August 17th :—

Squadron-Commander.—Lieut. (Temporary Capt.) J. E. A. Baldwin, 8th Hrs., from Flight-Commander, and to be Temporary Major whilst so employed ; July 1st, 1916.

Flying Officers.—Second Lieut. J. O. Leach, Midd'x R., and to be seconded ; July 8th, 1916. July 20th, 1916 : Capt. R. O. Bell-Irving, 16th Canadian Inf. Bn. ; Second Lieut. E. A. Floyer, Ind. Army Reserve of Officers, from a Flying Officer (Observer) ; Lieut. P. E. M. Le Gallais, R. Suss. R., from a Flying Officer (Observer) ; Temporary Second Lieut. G. G. Boyton, General List, from a Flying Officer (Observer) ; Temporary Second Lieut. J. Thompson, General List ; Second Lieut. E. J. Smyth, Special Reserve ; Second Lieut. H. S. Pell, Special Reserve ; Second Lieut. E. M. Wright, Special Reserve. July 21st, 1916 : Second Lieut. L. J. Bayly, R.G.A., from a Flying Officer (Observer) ; Second Lieut. E. S. T. Cole, Special Reserve. July 22nd, 1916 : Second Lieut. R. T. Griffin, Special Reserve ; Second Lieut. G. J. Harter, Special Reserve. July 25th, 1916 : Second Lieut. J. C. Hodges, R.G.A., Special Reserve ; Second Lieut. (Temporary Lieut.) W. H. S. Chance, Worc. R. (T.F.).

Memoranda.—Second Lieut. H. V. Rabagliati, from R.F.C., Special Reserve, to be Temporary Second Lieutenant on General List, for duty with R.F.C. ; July 21st, 1916.

To be Temporary Second Lieutenants for duty with R.F.C. : Warrant Telegraphist F. K. Crosbie-Choppin, from R.N.R. ; July 29th, 1916. Aug. 8th, 1916 : Cadet Officer K. K. Muspratt, from Sherborne School O.T.C. ; Cadet Officer S. E. Dreschfeld, from Sherborne School O.T.C.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank : C. M. Crow, J. H. Ryan, C. P. V. Roche, F. D. H. Sams, R. H. Timmis, D. E. Nicolle, H. W. Sellars, G. F. Hughes, J. Mitchell, G. E. Upton.

A. E. Blackmore to be Second Lieutenant ; July 7th, 1916.

To be Second Lieutenants (on probation) : A. B. D. Lang ; July 1st, 1916. G. Craig ; July 15th, 1916. July 24th, 1916 : H. Loeffler, D. N. Keith, P. B. Harris, A. T. Shaw. W. B. Brett ; July 25th, 1916.

The Christian names of Second Lieut. (on probation) G. P. Kay are as now described, and not as in the *Gazette* of May 22nd, 1916.

The following appeared in the *London Gazette* of Aug. 18th :—

Flying Officers.—Second Lieut. A. S. Butler, R.F.A. (T.F.) ; June 19th, 1916. June 22nd, 1916 : Second Lieut. (Temporary Lieut.) R. Burleigh, R.E. (T.F.); Second Lieut. W. L. Scandrett, Special Reserve.

Flying Officers (Observers).—Lieut. H. Turner, R.A., and to be seconded; March 17th, 1916. Temporary Lieut. R. Erskine, 7th R. Sco. Fus., and to be transferred to the General List; Aug. 3rd, 1916.

Assistant Equipment Officers.—Temporary Lieut. F. G. Wilson, General List, from a Flying Officer (Observer); July 28th, 1916. July 31st, 1916: Second Lieut. T. P. Whitcomb, Essex R. (T.F.); Temporary Second Lieut. J. Clinkskill, General List; Second Lieutenants, Special Reserve: A. H. Meldrum, G. L. Bennet, R. N. Corah, P. Maggs; Temporary Second Lieut. B. W. Morriss, General List. Second Lieutenants, Special Reserve: R. H. Tweedy, G. E. Upton; Temporary Second Lieut. A. Mackay, General List; Aug. 1st, 1916.

Memoranda.—The under-mentioned N.C.Os. and men to be Temporary Second Lieutenants (on probation) for duty with the R.F.C.: Pte. L. Waight, from 2nd Bn., Canadian Mtd. Inf.; July 9th, 1916. L.-Corpl. C. W. Adkin, from R.E. (T.F.); July 17th, 1916. 1st Class Air-Mechanic G. M. G. Bibby, from R.F.C.; July 19th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 19th:—

Squadron Commander.—Major S. Smith, E. Anglian Brig., R.F.A. (T.F.), from a Flight-Commander; July 30th, 1916.

Flight-Commanders.—From Flying Officers, and to be Temporary Captains whilst so employed: Lieut. D. A. L. Davidson, Special Reserve; June 1st, 1916. Temporary Lieut. S. W. Price, General List; Aug. 4th, 1916. Second Lieut. F. E. Goodrich, Special Reserve; Aug. 6th, 1916. Temporary Lieut. D. K. Johnstone; Aug. 8th, 1916.

Flying Officers.—July 20th, 1916: Second Lieut. (Temporary Lieut.) R. W. A. de H. Haig, Glamorgan R.G.A. (T.F.); Second Lieut. J. H. Ryan, Special Reserve; Second Lieut. F. D. H. Sams, Special Reserve; Second Lieut. H. W. Sellars, Special Reserve. July 21st, 1916: Capt. H. R. Raikes, E. Kent R., Special Reserve, from an Assistant Equipment Officer; Second Lieut. F. H. Creasy, R. Wilts. Yeo. (T.F.); Temporary Second Lieut. A. F. Livingstone, K. R. Rif. C., and to be transferred to the General List. July 23rd, 1916. July 24th, 1916; Lieut. (Temporary Capt.) O. L. Whittle, S. Lan. R. (T.F.); Lieut. (Temporary Capt.) A. Skinner, S. Lan. R. (T.F.); Second Lieut. (Temporary Capt.) G. M. Croil, Gord. Highrs. (T.F.). July 25th, 1916: Temporary Second Lieut. W. G. D. Turner, Middx. R., and to be transferred to the General List; Second Lieut. (on probation) S. McClure, N. Staff. R., Special Reserve, and to be seconded; Second Lieut. (on probation) B. A. Peck, R.F.A., Special Reserve; Second Lieut. C. M. Crow, Special Reserve; Second Lieut. A. P. Donnell, Northd. Fus., and to be seconded; Second Lieut. R. H. Timmis, Special Reserve; Lieut. (Temporary Capt.) R. O. C. Bush, R. Dub. Fus., to be seconded, and to relinquish his temporary rank. July 26th, 1916: Second Lieut. A. F. T. Ord, W. York. R., Special Reserve, and to be seconded; Second Lieut. C. P. V. Roche, Special Reserve. July 28th, 1916: Lieut. L. N. Sutherland, Bord. R., and to be seconded; Temporary Second Lieut. L. S. Ward-Price, Res. Regt. of 2nd L. Gds.; Second Lieut. J. Thwaytes, Bord. R., Special Reserve, and to be seconded; Second Lieut. R. E. Buckingham, Special Reserve; Temporary Second Lieut. A. L. Dunstan, General List; Second Lieut. D. H. Glasson, Special Reserve. July 31st, 1916: Temporary Second Lieut. A. J. O'Byrne, Lpool. R., and to be transferred to the General List; Second Lieut. M. H. Strange, R. Fus., and to be seconded.

THE FUNERAL OF LIEUT. IVAN CARRYER, OF THE EAST YORKS AND R.F.C., AT LEICESTER LAST WEEK.—Very great sympathy was shown in the district, where Lieut. Carryer was well known. Photo. shows the funeral procession on the way to the cemetery. The coffin was conveyed on an ammunition wagon, and the deceased's cap and sword were resting on it. In front was a wreath depicting the badge of the R.F.C. sent by the employees of the firm with which the deceased officer's father was connected.

The following appeared in a supplement to the *London Gazette* issued on August 21st :—

Staff Officer, 3rd Class (graded for pay as a Staff Captain).—Temporary Second Lieut. T. C. Macaulay, R.A., and to be Temporary Captain whilst so employed ; May 26th, 1916.

Squadron Commander.—Capt. P. C. Maltby, R.W. Fus., from a Flight-Commander, and to be Temporary Major whilst so employed ; Aug. 5th, 1916.

Flight-Commanders (*from Flying Officers, and to be Temporary Captains whilst so employed*).—Second Lieut. E. H. Johnston, Special Reserve ; Aug. 3rd, 1916. Second Lieut. C. T. Latch, N. Midland R.G.A. (T.F.) ; Aug. 6th, 1916.

Equipment Officers.—Temporary Capt. R. H. Austin-Sparks, General List, from a Flying Officer May 27th, 1916. The appointment of Temporary Lieut. G. L. Wightman, General List, is antedated to June 1st, 1916. *From Assistant Equipment Officers and to be Temporary Captains whilst so employed.*—July 22nd, 1916 : Temporary Lieut. G. H. Padley, General List ; Second Lieut. (Temporary Lieut.) W. J. Shields, Essex R., Special Reserve. Aug. 1st, 1916 : Qr. and Hon. Lieut. J. E. Parkin, R.F.C. ; Second Lieut. A. C. Gilling, Special Reserve ; Second Lieut. R. S. Rumbold, Som. L.I. Qr.-Mr. and Hon. Lieut. (Temporary Capt.) W. J. Ryan, R.F.C., from an Assistant to a Deputy Assistant Director, and to retain his temporary rank whilst so employed ; Aug. 1st, 1916. Lieut. F. A. G. Noel, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Capt. whilst so employed ; Aug. 12th, 1916.

Flying Officers.—July 28th, 1916 : Temporary Second Lieut. W. H. Farrow, General List ; Second Lieut. W. J. D. Vince, Special Reserve. July 29th, 1916 : Second Lieut. J. Hay, Special Reserve ; Second Lieut. J. D. Hewett, Special Reserve ; Temporary Second Lieut. P. A. Wright, General List ; Second Lieut. W. S. Shirtcliffe, Special Reserve ; Second Lieut. E. H. Wingfield, Special Reserve. July 30th, 1916 : Hon. Lieut. F. Facer, R.A.M.C. (T.F.), and to be Temporary Lieutenant ; Second Lieut. T. C. H. Lucas, Suff. R., and to be seconded ; Second Lieut. H. E. Startin, Special Reserve. Temporary Second Lieut. E. A. Worrall, Manch. R., and to be transferred to the General List ; July 31st, 1916.

Memorandum.—Corpl. S. T. Smith, from R.F.C., to be Temporary Second Lieutenant, for duty with the Military Wing of that Corps ; July 13th, 1916.

Supplementary to Regular Corps.—The under-mentioned Second Lieutenants (on probation) are confirmed in their rank : C. N. Russell, W. S. Shirtcliffe, S. G. Howard, W. J. D. Vince, E. H. Wingfield, H. E. Startin, A. L. Cockburn, R. H. Tweedy, P. Maggs, G. L. Bennet, R. N. Corah, J. D. Hewett, R. E. Buckingham, J. Hay.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties :—

Injured.

Flight Sub-Lieut. E. A. Pearson, R.N.

Accidentally Injured.

Flight Lieut. P. Legh, R.N.
Flight Sub-Lieut. F. P. Reeves, R.N. (August 14th).
Flight Sub-Lieut. A. A. Wallis, R.N. (August 14th).

Correction : **Prisoner of War in Germany.**
Flight Sub-Lieut. F. J. Bailey, should read
Flight Lieut. F. J. Bailey, R.N.

The following casualties have been officially announced by the War Office :—

Killed.

Capt. J. O'Brien, R.A.M.C., attd. R.F.C.
Second Lieut. H. M. B. Law, Royal Flying Corps.
10068 Corpl. J. R. Stringer, Royal Flying Corps.

Wounded.

Lieut. J. B. Brophy, Royal Flying Corps.
Second Lieut. S. E. Cowan, Royal Flying Corps.
Capt. S. G. Gilmour, Royal Flying Corps.
Capt. S. Grant-Dalton, D.S.O., Yorks. Regt., attd. R.F.C.
Second Lieut. I. M. Harris, K.R.R.C., attd. R.F.C.
Lieut. G. H. A. Hawkins, Manchester Regt., attd. R.F.C.
Lieut. D. K. Johnstone, Royal Flying Corps.
Capt. R. H. D. Lee, Norfolk Regt., attd. R.F.C.
Second Lieut. C. F. Overy, R. Fus., attd. R.F.C.
Second Lieut. L. W. B. Parsons, Royal Flying Corps.
Capt. E. H. Petre, Suffolk Regt., attd. R.F.C.
Second Lieut. L. C. Pockney, R.F.A., attd. R.F.C.
Second Lieut. E. H. Pullinger, Royal Flying Corps.
3836 Corpl. W. G. Moore, Royal Flying Corps.
4581 Corpl. A. Reed, Royal Flying Corps.
6717 2nd Class Air-Mechanic A. Stanley, R.F.C.

Previously reported Missing, now reported Wounded.

Second Lieut. A. H. Forester, Queen's (R.W. Surrey), attd. R.F.C.

Missing.

Second Lieut. C. W. Blain, Royal Flying Corps.
Second Lieut. C. Geen, London Regt., attd. R.F.C.
Second Lieut. C. D. Griffiths, R. Welsh Fus., attd. R.F.C.
Second Lieut. J. W. Gunton, Somerset L.I., attd. R.F.C.
Capt. E. W. Leggatt, Wilts Regt., attd. R.F.C.
Lieut. J. A. Mann, D.S.O., Cameronians (Scott. Rif.), attd. R.F.C.
Second Lieut. R. M S. Shepherd, R. Irish Regt., attd. R.F.C.
Capt. D. M. V. Veitch, Indian Cavalry, attd. R.F.C.

Prisoner of War.

Captain S. C. Winfield-Smith, E. Surrey Regt., attd. R.F.C.

Previously reported Missing, now reported Prisoners of War.

Capt. W. W. Jefferd, Middlesex Regt., attd. R.F.C.
Lieut. W. O. J. Tudor-Hart, North'd. Fus., attd. R.F.C.

Previously reported believed Taken Prisoners of War at Kut-el-Amara, now reported Prisoners of War.

Second Lieut. C. H. Courthope-Munroe, I.A., Res. of Off., attd. R.F.C.
Capt. S. C. B. Mundey, Oxon and Bucks L.I. and R.F.C.
Capt. T. R. Wells, Infantry, attd. R.F.C.

Honours for the R.F.C.

IN a supplement to the *London Gazette*, issued on August 20th, it was announced that His Majesty the King had been graciously pleased to approve of the appointment of the under-mentioned officer to be a Companion of the Distinguished Service Order, in recognition of his gallantry and devotion to duty in the field :—

Temp. Sec. Lieut. A. L. GORDON-KIDD, Special List and R.F.C.

For conspicuous gallantry, skill and determination. On one occasion he dived his machine from a height of 7,500 ft. to 900 ft., and placed a bomb on the enemy's ammunition train, which set it on fire and blocked the line. A few days afterwards he performed another very hazardous undertaking well within the enemy's lines, whilst exposed the whole time to all descriptions of heavy fire.

It was also announced that His Majesty the King had been graciously pleased to confer the Military Cross on the under-mentioned officers in recognition of their gallantry and devotion to duty in the field :—

Lieutenant O. T. BOYD, Indian Army and R.F.C.

For conspicuous gallantry when on a bombing raid in unfavourable weather. He descended to less than 1,000 ft. and bombed a train, which he afterwards attacked with his machine gun, though heavily attacked by rifle and machine-gun fire.

Lieutenant R. G. GOULD, R.F.C., Special Reserve.

For conspicuous gallantry and tenacity. While reconnoitring he was attacked by two enemy machines, and, though wounded in the leg, drove one down and the other away. He then continued his work, though heavily fired at by anti-aircraft guns. Finally he was compelled by weakness to return, and on landing was taken to hospital.

Sec. Lieut. H. A. TAYLOR, R.W. Kent Regt. and R.F.C.

For conspicuous gallantry when on a bombing raid in unfavourable weather with Lieutenant Boyd and two other pilots. He descended to less than 1,000 ft. and bombed a train, derailing several trucks.

FROM THE BRITISH FLYING GROUNDS

Beatty School, Hendon.

THE following pupils were out during last week: Messrs. Cuthbert, Hathaway, Le Champion, Earl, Mitchell, Rudd, Turner, Towson and Austen.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes.

Certificates were taken during the week by Messrs. B. J. Earl, D. Mitchell, and P. Rudd (on Caudron machine), and V. G. Austen and G. le Champion (on Beatty-Wright machine).

Hall School, Hendon.

IN spite of very windy and wet weather and thunderstorms, the following pupils were able to put in practice between the showers last week: With Stanley G. Cownie: Messrs. Mayer, Course, Yuill and Bateman. With Fred. J. Glegg: Messrs. Stamps, Barton, Henley and Flight Sub-Lieut. Malden.

Lieut. Packman and Messrs. Orton, Cordner, Rayne and Gudger, pupils with Mr. Cecil M. Hill, should soon qualify.

Hall (Government type) tractors in use.

London and Provincial School, Hendon.

PUPILS doing straights last week: Messrs. Quayle, Davy, and Sellars. Circuits and eights: Messrs. Fox, Randell, Mander, Lewis, and Rogers.

Instructors: Messrs. W. T. Warren, M. G. Smiles, W. T. Warren, Jun., and P. G. Allen.

Royal Aero Club Certificate taken by Mr. G. H. Rogers.

Ruffy-Baumann School, Hendon.

SCHOOL out last week: Wednesday, Thursday, Friday, Saturday and Sunday. Pupils with instructors: Messrs. Hayes, Babington Smith, West, Holmes, Carr, Trubridge and Fanshawe. Doing straights or circuits alone: Messrs. West and Holmes.

During the week Mr. West took his certificate in very good style.

Instructors: Ed. Baumann, Félix Ruffy, Ami Baumann and André Thomsen.

50 and 60 h.p. Ruffy-Baumann tractor biplanes in use.

Passengers carried during the week by Ami Baumann and André Thomsen.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Davies, Constant, Lloyd-Owen, Holland, Wilmott, Montgomery, Wingfield and Ross.

Doing straights alone: Messrs. Brandon, Hammersley, Pritt, J. B. Smith, Fenn, Hinchliff and Adamson. Half circuits alone: Messrs. O. Wilson, J. Wilson, Daniel, and H. Smith.

Instructors: Messrs. S. Summerfield and E. Brynildsen. Two 35, 45 and 60 h.p. Caudrons in use.

Owing to the exceptional windy weather no school work of any importance was carried out. Several pupils are, however, almost ready to take their "tickets."

Mr. Summerfield gave a very interesting exhibition of flying on Saturday afternoon in a high wind of from 45 to 50 miles an hour.

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Group of pupils at the Ruffy-Baumann School, Hendon, who have taken their tickets there.—(1) Mr. J. de Balme, (2) Mr. M. Johnstone, (3) Mr. J. Beebee, (4) Mr. S. Wilson, (5) Mr. J. Edgar, (6) Mr. Keith Muspratt, (7) Mr. G. Straus (Belgian subject), (8) Mr. Philip Wood.

Flying at Hendon

LAST Saturday's visitors to Hendon saw some good flying of a varied character, including looping displays. Looping, in fact, is becoming quite a regular feature of the air work at Hendon now. M. G. Smiles and "Wee Willie Warren" did the looping turns on the new L. and P. tractor biplane. On one occasion the last-named pilot, with Mr. Fletcher—who, by the way, must form part of the equipment of the machine, since he is rarely out of the passenger's seat—as passenger, "went mad" above a garden party that was in progress away yonder just outside the aerodrome, and performed all sorts of antics. That this unexpected exhibition was appreciated was evident from the fact that as the two turned back to the aerodrome the sounds of cheers and clapping of hands floated up to their ears above the noise of the engine. L. L. King went up on the Beatty-engined Wright and executed some nice banking. Several passengers were taken on the 80 h.p. three-seater Grahame-White biplane by the Grahame-White pilots, C. Pashley on one occasion making a fine high flight together with some well-banked turns and a very graceful landing. During the afternoon several Service machines passed over the aerodrome at a great altitude, whilst the large Curtiss tractor (model R2 type) and a B.E. 2 C made numerous ascents from the aerodrome. H. Sykes, who had flown over from Hanworth on the Martinsyde the previous day, started out with a lady passenger for Shepherd's Bush, where Messrs. Waring and Gillow, Ltd., were holding a Sports Day, but, owing to some engine trouble, was delayed in getting away. An H.P. "Baby" also paid a visit to the aerodrome and created some considerable interest, especially with its remarkably slow and flat glide.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to August 15th, 1916	10,815	8	7
Collected at the Westland Aircraft Works, Yeovil (Forty-fourth contribution) ..	0	18	0
Employés of Ruston, Proctor, and Co,, Ltd. (Tenth contribution)	1	10	0
Total, August 22nd, 1916 ..	10,817	16	7

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

G. Q., R.N. (Maidenhead).

We quite appreciate your difficulty in obtaining any definite information on the pitch ratio of propellers, since this varies very considerably, according to the type of machine and engine used. In the first place, the diameter of an air screw is more frequently determined by constructional considerations than by attempts at maximum aerodynamic efficiency. As regards the pitch of the air screw, this depends, of course, on the speed of the aeroplane on which the screw is to be employed, and on the normal speed of revolution of the engine; and also on whether the screw is to be driven direct or through reduction gearing. It is impossible to lay down any hard and fast rules, but a few examples may be of assistance in showing how all the various values of the pitch ratio given by the authors mentioned in your letter may be correct in particular instances.

For example, suppose the machine in question is a fast scout, designed to do a speed of 110 m.p.h. If the engine revolves at 1,200 r.p.m. and direct drive is employed, the pitch of the air screw would be about 8 ft. The diameter permissible on a machine of this type would be in the neighbourhood of 8 ft., thus giving a pitch ratio of 1.

Again, on a machine like the Maurice Farman, doing about 70 m.p.h. and having a Renault engine revolving at 1,800 r.p.m. driving the screw through a 2 to 1 reduction gearing, the pitch would be about 6·8 ft. or 7 ft. The diameter of the propellers fitted is, we believe, about 9 ft. 6 ins., giving a pitch ratio of 0·73.

If we take a B.E. also using a Renault engine and running the screw at half engine speed, designed for a speed of, say, 95 m.p.h., we have a pitch of about 9·2 ft. With the standard height of undercarriage the permissible diameter is about 9 ft., and the pitch ratio therefore 1·2 approximately. The above figures should not be taken as being absolutely correct, but are merely intended to show the reasons for divergencies in pitch ratios.

H. C. B. (King's Lynn).

There are various reasons why tractor screws differ from propellers or "pusher" screws. Thus, for a given forward speed of an aeroplane the tractor screw has a greater velocity of entry into the air than has a propeller, on account of the fact that the wings of the machine exert a certain amount of viscous drag upon the air. If, therefore, the screw is shifted from the front of the wings to the back, this will mean that it will then have to be run at a greater slip, and consequently at a smaller efficiency.

J. M., R.F.C.

The phenomena known as "pockets" or "bumps" are not in reality "holes" in the air, but are rather to be considered as currents or various direction gusts. For instance, one may speak of head gusts, rotary gusts, up gusts, rear gusts, and down gusts. The head-on gust virtually increases momentarily the air speed of a machine, and therefore results in an upward swoop. The up gust tends to lift the machine bodily, while, of course, a down gust causes it to drop. A rear gust also tends to cause the machine to drop, since it has the effect of decreasing the relative speed of the machine through the surrounding air. For instance, a machine flying in a calm at 70 m.p.h., and suddenly entering an air current of a velocity of 30 m.p.h., blowing in the same direction as that of the machine, will actually have its relative speed reduced to 40 m.p.h., resulting, of course, in a loss of lift, which must be counteracted by using the elevator, thus increasing the angle of incidence of the wings. Little is at present known regarding rotary gusts, but it is conceivable that a machine entering such a whirl would be affected both by the whirl and by the linear velocity generated by it, and therefore experience a greater disturbance than if it had met a pure head-on gust.

ARMCHAIR REFLECTIONS

By the "Dreamer"

SPEEDING southwards, a passenger in a luxurious car, I leant back in the soft cushions with queer feelings, for I was being hurried to the home of a Dreamer; was to meet another, and I had the sensation of being stillborn—hurrying to meet myself.

The car sped over the smooth ground, apparently without effort, and my companions respected my reverie. Hardly a word was spoken, yet I seemed to feel their looks upon me. I felt captured. It seemed to me that a well laid plot had matured, and that here was I, passively rebellious, being taken by gentle force to where? to what?

I had the feeling that I was some strange animal captured in the wild, being taken to view my counterpart in captivity, or, was it *vice versa*? There seemed to be a suppressed expectant atmosphere integral to the car; an emission from the bodies of my companions. There was the air of taking a prize bantam of fighting stock to be placed in the cage of another of reputation, the pleasure of those concerned being obtained by stepping back to watch whether they would rub combs in all friendliness, or strut around, heads thrown back, awaiting opportunity to strike.

In the distance the aeroplane was riding the wind, and as I looked I wondered whether I was about to see something that should have been in the early days, before these graceful machines stretched their white wings to the element, or whether I was about to witness something that would make those far-stretched wings things of the past. For that which I was about to behold as the dreams of a Dreamer in the concrete, was none other than the flapping wings, a machine of birdlike form which, with spread pinions, should soar into the air, majestic as any eagle.

The prize bantams did not fight, all association of environment was against it. The Dreamer was a dreamer, and looked it; my counterpart was of myself. Not in rosy chamber did I find him. No Cupids undressed in flimsy gauze rode astride the clouds on painted ceiling, no Arabian perfume greeted the nostrils.

The dream chamber was a garden, the ceiling was heaven, the perfume that fascinating odour given out by black currant bushes laden with juicy fruit.

The machine with its flapping wings stood amongst the potatoes; cabbages waved their heads all around. I could have laughed—how incongruous, how impossible, yet how glorious. It was delightful; I could have shouted hurrah for sheer joy, had I not been suspicious that tears might well up to stifle the final effort. For here was the result of years of patient dreaming—a machine with two beautiful birdlike wings stretched out over the potatoes.

In the shade, under the apple trees, there stood a camp bed with overlay above spring mattress, and near by a table lumbered up with camp equipment. Here one could lie with that pair of wings stretched in full sight, and here, no doubt, had lain that dreamer of dreams, seeing in his imagination the day when machines with flapping wings should take the air.

Nor am I prepared to take responsibility that he shall not see the realisation of his dreaming, for there is much in it that cannot be lightly thought of, much that embodies a very great deal more than possibility.

I saw the machine at work, partly chained to the ground as it was. I saw its inventor turn the wheel —cumbersome and makeshift, that imparted action to the cranking movement—and I saw the wings rise and fall in perfect rhythm, and with lifelike movement, and I saw the machine, with a 28-lb. weight attached as extra load, rise a foot into the air with every downward sweep of the wings.

Let it be remembered that this was but a model, clumsily made of wood and iron, heavy for itself, laden with bars and chains and gear wheels, and that the far end of the power shaft was attached to a post fixed to the ground. And that the wings were but of some 5 ft. in length, with, perhaps, half that chord.

The man power as applied could not, in the circumstances, be applied regularly, and the wings sometimes took up a slightly uneven movement in consequence; but as the wings rose and fell, driving the air out from beneath them, the potatoes and cabbages waved and nodded their heads in the artificial breeze, appearing to register their vote in the affirmative to the unspoken question of us who stood around wondering.

There could have been nothing in turning the crank, yet like unto children we all had to have our turn at the wheel, watching the wings feather upward, offering no resistance, to flatten out at the top of the stroke and bear gracefully downward to vegetable encouragement.

Turning cranks is warm work on a hot day, and iced ale and cigarettes, partaken of under shady apple trees, very cooling and conducive of chatter. And so we all sat around theorising over possibilities and probabilities, seeing difficulties where there were none, and digging out some that were latent, withal coming away, if anything, rather more undecided than when we went.

For such is the power of these things which we approach in a spirit of gentle, if aggressive tolerance, these things which on contact with, we have to admit in everyday parlance, may have "something in them," that there is a kind of aftermath of indecision, a time when we all hold our tongues and try to remember what it was we said before the exhibition.

I am prepared to be surprised. I am prepared to see in the future machines of low power propelling their way on different principles to that which we know to-day.

In these days we must be prepared for anything. It may be that one day I shall flap cheerfully to business.

AVIATION IN PARLIAMENT.

No Quarterly Insurance Policies.

MAJOR NEWTON, on August 14th, asked the Prime Minister whether he will consider the advisability of having a fixed premium covering all risk from hostile attack, whether from the sea or air, so that owners of property on the East Coast may no longer be compelled, merely in consequence of their geographical position, to pay an extra premium as compared with owners of other property; whether the present rate of insurance against damage from the air is ample to cover all war risks; and whether arrangements can be made for these policies to be renewable quarterly at a proportionate premium, failing which will he announce that in the event of the risk ceasing during the currency of a yearly premium a proportionate return of premium will be made.

Mr. Harcourt: The Prime Minister has asked me to answer this question. I fear it would not be possible to abolish the distinction between the two kinds of policies provided by the Government scheme, or to say with any confidence at this stage whether a lower rate would or would not cover all risks. I am advised that the issue of quarterly policies, except as provided in the scheme, would be open to serious practical objections, and that it would not be possible now to give any undertaking as to return of preminm.

Non-Poisonous Dope.

MR. ROWLANDS, in the House of Commons on August 8th, asked the Financial Secretary to the War Office—(1) whether, in the contracts given to the various aeroplane manufacturers there is a specification of the particular dope to be used; if so, can he say what are the special dopes so named, or are the manufacturers allowed to use the non-poisonous dopes upon the market; (2) the Secretary to the Admiralty whether, in the contracts given to the various aeroplane manufacturers, there is a specification of the particular dope to be used; and, if so, can he say what are the special dopes so named, or are the manufacturers allowed to use the non-poisonous dopes upon the market?

Major Baird (representing the Air Board): I have been asked to deal with these questions. Considerable progress has been made in the production of satisfactory dopes of a non-poisonous kind, and the Admiralty and the War Office have recently issued instructions to contractors specifying various non-poisonous dopes which meet their requirements. The effect of these instructions is that the use of dopes containing tetrachlorethane is no longer permitted for the purposes of either the Naval or the Military Air Service unless the non-poisonous dopes cannot be obtained. Any cases of failure of supply of the non-poisonous dopes will be made the subject of special inquiry. Of the eight doping schemes approved, seven are supplied by the trade.

Mr. Rowlands: May I ask the hon. and gallant member whether the other dopes used by private manufacturers are allowed to be used where the demand is for them?

Major Baird: Subject to their complying with the specifications which have been circulated, of which I shall be happy to send my hon. friend a copy.

Dover Anti-Aircraft Corps.

MR. R. MCNEILL asked the Secretary of State for War if it has been decided to disband the Dover Anti-Aircraft Corps and to replace it by a corps drawn from London Electrical Engineers; whether the Dover Anti-Aircraft Corps has been serving for twenty months, during which it has been repeatedly congratulated on its efficiency and never censured; whether he is aware that the intimate local knowledge possessed by the men is of great value in enabling them to distinguish the sound of hostile aircraft from similar local noises, and that an incentive to zealous service is afforded by the fact that as a local corps the men are charged with the protection of their own homes; whether on the only three occasions when Zeppelins have approached Dover the corps detected the enemy and illumined the aircraft so as to give full opportunity for the anti-aircraft gunners, who were thus enabled on one of the three occasions to damage the invader; whether the intended change will involve considerable increased expenditure; and if he will say why, under these circumstances, the change is to be made?

Mr. Forster: The disappearance of this corps, which was composed partly of naval active service ratings and partly of local men who were able to give only part-time service, has resulted automatically from the introduction of the Military Service Act, and from the transfer of the anti-aircraft defences from the Navy to the Army. The result is that the naval active service ratings have been handed back to the Admiralty, by whom they were required; the members of the corps eligible for general service have been enlisted for general service, and those eligible for home service only have been enlisted in the London Electrical Engineers and will be employed as far as possible at Dover. The good work done by this corps in the past is fully recognised.

Mr. McNeill: Does my hon. friend realise that there is very great local dissatisfaction?

Mr. Forster: I am very sorry to hear it, but I am afraid under the circumstances which I have narrated in my answer the proceedings were inevitable.

Cost of Tuition in the Services.

COMMANDER BELLAIRS, on August 15th, asked the First Lord of the Admiralty if he will state the average cost of tuition in flying at Government establishments of pupils for the Royal Naval Air Service up to the obtaining of their brevets, including a fair proportion of aerodrome expenses, maintenance and wastage of aeroplanes and engines?

Dr. Macnamara: It would not be possible to give the information asked for without obtaining details from the local establishments with much subsequent investigation and collation at the Admiralty. In view of the present pressure of urgent executive work, it is regretted that it is not practicable to undertake this additional work.

Co-operation between the Services.

MR. BENNETT-GOLDNEY asked the Prime Minister whether he will take steps to put an end to the still existing lack of co-operation between the Royal Naval Air Service authorities and the Military Air and Anti-Aircraft Services; if he is aware that only recently, in substituting the military authority for the naval authority at an important station now moved somewhat further inland, the efficiency of the equipment has been impaired by replacing the more powerful electric projectors by others of a less power and by the provision of obsolete Boer war guns of a harmless nature beyond a very short range; whether his attention has been called to the inefficiency of our anti-aircraft defences when, during one of the recent Zeppelin raids, the projectors at an important station were found to be quite inadequate as they could only flash their lights effectively to a low altitude, and that although such anti-aircraft guns as had been provided fired incessantly none of the shells got anywhere near to their objective; and, in these circumstances, if he will consult with his naval and military advisers and ask them to point out to their respective Departments that, although the public is willing to make any necessary sacrifice, they are altogether opposed to the present lack of co-ordination between the two Services which still continues to minimise the effectiveness of our anti-aircraft defences as a whole?

Major Baird: In the present case no question of coordination or lack of co-ordination between the two Services arises, for the reason that the guns and searchlights of the place which I have been privately informed by my hon. friend that his question refers to, though originally in the hands of the Admiralty were transferred from the Admiralty to the military authorities, and are now under the control of the Department responsible for Home Defence. I have made careful inquiry, and am assured that the searchlights now employed are of the same type as were in use when the defence was in the hands of the naval authorities. No guns have been removed except on replacement by others of a more efficient kind.

Single Men at the R.A.F.

MR. CHARLES DUNCAN, on August 16th, asked the Financial Secretary to the War Office whether he is aware that at the Royal Aircraft Factory, Farnborough, married men are being discharged, while numbers of single unskilled men are being retained; and whether, in view of the dissatisfaction being caused by this action, he will investigate the matter with a view to securing more equal treatment?

Mr. Forster: No, Sir. I am informed that single unskilled men are only being retained in a few cases, and that these will be dispensed with as soon as suitable substitutes can be obtained.

THE ADVISORY COMMITTEE'S ANNUAL REPORT.

LAST week the Annual Report of the Advisory Committee for Aeronautics for the year 1915–16, presented to the Rt. Hon. H. H. Asquith, M.P., First Lord of the Treasury, was published as a White Paper. We reproduce the Report in full below :—

"SIR,—A large increase in the amount and extent of the work carried out under the control of the Advisory Committee for Aeronautics has taken place as a result of the war.

"Mr. Tennyson d'Eyncourt, Director of Naval Construction, was recently appointed an additional member of the Committee.

"Some new problems have required attention during the course of the past year, but in the main the work has been directed to meeting the immediate needs of the Services in regard to the design and development of aircraft. The main principles to be followed in design, and the more immediately necessary general data required in their application, had been determined previously, but the developments in detail have been very numerous, and the detailed information required as to the aerodynamic properties of a number of different types of machine, with the proposed modifications arising in the course of design, have entailed a great amount of experimental work. Progress with a number of investigations of more general character, and of considerable importance, has in consequence been unavoidably delayed, but the increased facilities recently provided, to which reference is made below, will, it is hoped, render possible a more rapid advance with researches relating to the general aerodynamic characteristics of the aeroplane, which have a direct bearing on the improvement of all types of machine.

"*Provision for experimental work at the National Physical Laboratory.*—The fundamental necessity, in the development of aircraft, of proceeding on the basis of exact knowledge derived from accurate investigation under experimental conditions is now clearly recognised in this country, and the demand for exact information has led to continuous growth in the provision made for experimental work at the National Physical Laboratory. This provision now covers four main branches of research : (1) Aerodynamics, including the determination of the forces acting on models of aircraft, and of their various parts, as well as general investigation of the motion of bodies through fluids. (2) The study of fabrics for use in the construction of aircraft, and of methods of proofing and protection, the examination of dopes, varnishes, protective pigments, &c., and other chemical work. (3) The investigation of materials, especially light alloys, for use in aircraft construction, and their production under manufacturing conditions. (4) The examination of special questions which arise in connection with airships or seaplanes in relation to their use at sea. In addition to these four principal sections of the work, a large number of special questions receive attention from time to time at the Laboratory, *e.g.*, those relating to instruments or accessories for use on aircraft, the investigation of breakages, &c.

"The principal equipment available, at the commencement of the period under review, for research in aerodynamics, comprised three air channels—a 3-ft., a 4-ft. and a 7-ft.—together with a whirling arm for tests of propellers, and some small air and water channels for the photographic investigation of fluid motion. Under the conditions existing these have not been found sufficient during the past year to enable the requirements of the Services to be met, and, at the urgent request of the Admiralty and War Office, additional channels have recently been constructed, and are now in use. The 7-ft. channel had been found of great service in general experimental work, and, after careful consideration, it was arranged that a second 7-ft. channel should be provided, as well as another 4-ft., together with the necessary machine tools for model-making, and other incidental equipment. New buildings had to be erected for these channels, as well as for the increased office and workshop accommodation necessary. The erection of these buildings, the construction of the channels, and the provision of much of the equipment was undertaken, with the consent of the Treasury, by the Office of Works, and the Committee is much indebted to Mr. Baines, the Principal Architect of the Office of Works, for the rapid and successful completion of the work. The necessary provision has been made by the Treasury for the increased staff required for working the new channels.

"Some additions to the staff and equipment have also been necessary in the Departments dealing with fabrics and chemical work, and light alloys, respectively. The rolling mill, to which reference has been made in previous reports, has been at work for some time, and its value has been very fully demonstrated during the past year.

"By express desire of the Admiralty, provision has also been made for a considerable increase in the experimental work, in connection with seaplanes, carried out in the William Froude National Tank.

"As a result of the experience gained with the earlier channels, some improvements have been introduced, in the new equipment, in the design of the channels and of the measuring apparatus employed. Continued experience has confirmed the accuracy and convenience of the methods of measurement adopted. A recent report of the Smithsonian Institution states that the Massachusetts Institute of Technology, after careful study of existing channels in other countries, has adopted in its Aeronautics Laboratories a channel and balance of the N.P.L. type, with but slight modifications. Drawings of the balance for the 7-ft. channel have also recently been furnished, at their request, to the Navy Department at Washington.

"*Experimental work in aerodynamics.*—The work done in the air channels has been largely directed to the determination of data immediately required for purposes of design. A considerable amount of information of general value has, however, been obtained and will be published later. Use of the 7-ft. channel has enabled the range of values of vl/ν at which experiments are conducted to be appreciably extended, thus throwing further light on the exact numerical relation between the full scale and model coefficients which define the wind forces. Experiments on spheres have been made, both in the wind channels and in a natural wind, and the results compared with those obtained in other laboratories, especially those of Eiffel and Prandtl. The urgency of other work has, however, prevented the complete interpretation of the varying results obtained for spheres of different sizes, at different wind-speeds : it is hoped that opportunity will arise later of carrying to a successful conclusion this investigation, which is of great theoretical interest and may throw light on other questions of more immediate practical importance. Similar series of experiments have been conducted on struts and fair-shaped wires, as well as on wing forms ; while the effect of change of scale on the region of unstable flow has been examined for aerofoils of special type.

"Much time has been devoted to measurements of the wind-forces on complete machines, and examination of the results of modification of individual parts. The results thus obtained will be of general interest, and of importance in future design.

"A new apparatus for the measurement of moments has been designed and constructed, and enables higher accuracy to be attained than that hitherto employed.

"Apparatus has also been devised for measuring the velocity and direction of flow in the air current at any point in the neighbourhood of a model. This will facilitate the study of the velocity distribution and the character of the flow round models, and will assist in the explanation of observed variations in the wind-forces on auxiliary surfaces.

"Some further questions in connection with the stability of the aeroplane have been investigated. Continued application has been made of the theory previously developed, and some improvements in detail have been effected. In particular, the effect of the use of the controls has been examined.

"Experiments on models of kite balloons have been made, and the conditions affecting the equilibrium of more than one type examined. The stability of these balloons has also been investigated. The conclusions reached are of definite practical importance, and, when applied in practice, should overcome some of the difficulties hitherto experienced in the manipulation of kite balloons.

"*Air-screws.*—With a view to securing increased accuracy in the designing of air-screws to fulfil specified conditions, new apparatus has been designed for the testing of air-screws in a wind channel, and for determining the distribution of pressure over the blades. Careful comparison has been made between the results of air channel measurements on air-screws, and those obtained from experiments on the whirling arm. In connection with this work, close examination has been made into the degree of accuracy obtained in the experimental methods employed in tests of air-screws on the whirling arm. The result of these investigations was to confirm the satisfactory character of the results obtained in the observations on the whirling arm, and to show that channel measurements on air-screws, under the conditions adopted, can also be relied upon to give accurate results. In view of the great saving of time and labour, it is proposed, in general, in future, to employ air channel methods in the testing of air-screws.

"The continued use of the existing air channels on more immediately urgent work has delayed somewhat the further prosecution of the experiments on air-screws. With the additional channels now available, it is hoped that it may be found possible to resume the investigation at an early date.

"*Strength of construction.*—The considerations affecting the views held as to the 'factor of safety' to which manufacturers should work in aeroplane design and construction, have been somewhat complicated by the introduction of new factors arising out of the conditions and dangers of active service in the field. The preliminary figure laid down by the Committee has, however, been found convenient in general as a basis for design. Considerable attention has from time to time been given to improvements in detail, and continued investigation into all questions affecting the strength and durability of the machine tends constantly to increased security. In particular, a number of cases, of theoretical interest, have been investigated of fracture or failure occurring owing to vibration originated by the engine or other cause, with synchronisation and resonance in the part affected.

"A large number of investigations have been carried out during the year, at the request of the Service Departments, into methods and processes employed in the construction of aircraft and engines. Among these may be mentioned the use of autogenous welding, the annealing of hard drawn steel tubes, methods of soldering in connection with light alloys, &c. Some of these investigations have led to important results of more general value.

"A suggestion was made to the Committee that certain Australian timbers exhibited special properties which might render them of value in aeroplane construction. By the courtesy of the Agent-General for Western Australia, specimens of some of these timbers are being placed at the disposal of the Committee, and will be submitted to trial.

"*Experimental work in the William Froude National Tank.*—A number of investigations in relation to aircraft have been carried out during the year in the Froude tank. In particular, the experiments on floats have been continued and extended. In view of the importance of this work, an urgent request was made by the Air Department of the Admiralty for increased facilities, and additions have accordingly been made to the staff and equipment, for which special provision has been granted by the Lords Commissioners of H.M. Treasury.

"*Fabrics.*—The work done by the 'fabrics' department of the Laboratory includes the examination of the strength, permeability and other properties of airship and aeroplane fabrics, the investigation of methods of gas proofing and waterproofing, and of dopes, varnishes, paints, &c. The work during the past year has been exceptionally heavy, and numerous matters have arisen requiring special investigation. The Committee is indebted to the Autotype Co. and to the North British Rubber Co. for assistance rendered in the experimental investigation of methods of proofing fabric, and of preventing deterioration.

"Interesting results have been obtained from the examination of fabrics exposed in the tropics. The experiments have been carried out with the co-operation of the Air Department of the Admiralty.

"*Light alloys for aircraft construction.*—The systematic study of light alloys for aircraft construction has been continued. In this connection, the experimental rolling mill recently provided, and referred to in previous reports, has been of the greatest value, and has enabled the examination of these alloys to be continued beyond the laboratory stage, under conditions closely approximating to those which arise in manufacturing practice, but with greater facilities for the precise control of the various factors affecting the quality of the product, such as the exact constitution of the alloy, the temperature of rolling, &c.

"A number of special questions relating to alloys have been referred to the Department for investigation, and it has been necessary to ask for an increase in the provision made for such work.

"*Special matters.*—Experiments have been carried out on the aerodynamic properties of bombs, and investigations and calculations have been made with regard to the flight of bombs, with a view to increased accuracy of aiming. The Commandant of the Central Flying School has furnished valuable assistance and information to the Committee in this connection, from the results of experiments there undertaken.

"Questions connected with the aeroplane compass were laid before the Committee by the Superintendent of the Royal Aircraft Factory in the autumn of 1913. These led to an examination into a number of points connected with the use of compasses on aircraft, in which members of the Committee assisted, while a close study of the conditions affecting the aeroplane compass, with a view to its development and improvement, was undertaken at the Royal Aircraft Factory by Dr. Keith Lucas, F.R.S. As a result of these experiments, which commenced early in 1914, various modifications from the compass previously in use were suggested and adopted, and a type of instrument specially adapted for employment on an aeroplane under the varying conditions which arise in flight was ultimately produced and standardised. Fliers are much indebted to Dr. Lucas for the success attained in this investigation. The Committee desire also to thank the Admiralty Superintendent of Compasses for information recently furnished to them with regard to the type of compass adopted for naval use on aircraft.

"Other questions which have been the subject of special investigation relate to the properties of permanent magnets as affecting their use in magnetos, the design of sighting apparatus, both for bomb dropping and in connection with aerial musketry, &c.

"A number of special matters have been investigated at the request of the Board of Invention and Research and the Munitions Inventions Department. The Committee has also given assistance to these bodies in the examination of patents and designs submitted to them, relating to projected improvements in aircraft.

"FULL SCALE WORK AT THE ROYAL AIRCRAFT FACTORY.

"Full scale research by experiment and observation upon aeroplanes in flight has been continued, and written records of the flight path, both controlled and uncontrolled, have been obtained. Many improvements in engines, air-screws and controls can only be made as the outcome of experiment upon actual machines, and these tests occupy the larger part of the flying time of the necessarily restricted number of aeroplanes available.

"As regards aerodynamic qualities, it has become increasingly important to predict with accuracy the performance and stability of an aeroplane while it exists only in drawings, and to be able to arrange that the movement of its centre of lift, the size and position of fins, the position of its centre of gravity, &c., are such as to ensure that it shall have adequate stability and control.

"It has been possible, by the issue at the outbreak of war of complete working drawings, to obtain strong, stable and serviceable aeroplanes in quantity from firms who had no previous experience of aircraft building.

"By the analysis of observations taken in experiment upon aeroplanes in the air in climbs, glides and level flights, progress is being made towards determining the aerodynamic characteristics of the aerofoil and other parts, so that a guide may be available for correctly interpreting the model results and linking them with the full scale data.

"*Strength of construction.*—The value of strength and good construction in saving aeroplanes from damage and reducing the amount of work required for their efficient upkeep in the field has been fully borne out by the experience of the Expeditionary Force. In view of considerations of safety of a different kind, which render necessary the sacrifice of all possible weight in the interest of the highest performance, the instruction calling for a strength factor of six, to be increased, if possible, to twelve, has been varied in practice, so as to admit in some cases a substantially diminished factor. This lower factor demands that still greater precision in calculation of strength shall be used. Instruction and information as to these calculations has been freely given to aeroplane constructors and designers.

"Recent Laboratory tests have shown that raf-wires of the type developed at the Factory show little or no aerodynamic disadvantage as compared with wires of stream-line section, and in view of their mechanical advantages and easier production they have accordingly been standardised and their use has been put at the disposal of aeroplane constructors. Universally jointed end fittings have been employed as an additional precaution against the effect of vibration. The reliability of the wires, when properly heat treated, has been assured by vibration tests at the Laboratory.

"Great attention has been paid to the thorough testing of all metals used in aircraft construction, and a specimen from every bar is individually tested. Owing to the high demand for mild steel of less good quality for shells, the difficulty found in obtaining the better class of material required for much of the work on aeroplanes has been overcome by micrographic and temperature studies of the metal at the Factory, and the treating of the steel as delivered till the better quality is secured. Advice and assistance has been given to constructors with regard to their heat treatment plant.

"*Design and construction of aeroplanes.*—New machines and new wing sections have been designed to take advantage of new knowledge, and appreciable improvement for a given engine power and weight has been obtained. Development proceeds by the making of a few trial machines, and four main types have been standardised for contract purposes. In new types guidance has been received from the experience of the Royal Flying Corps in the field, and in all cases it has been found possible to secure stability under ordinary flight conditions. Certain aeroplane constructors have taken advantage of a new device for saving weight in design, of a fair-shaped design of tail, a steerable rear skid and other details. Special attention has been given to the provision of suitable landing gear, and in large machines an air and oil recoil mechanism has been successfully introduced. The improvement of air-cooled and of water-cooled engine design and construction has been the subject of continued study, resulting in new designs and their development, with the help of the firms concerned. Two new devices are being tested for improving the performance at heights.

"*Instruments.*—Owing to the greatly increased demand for aeroplane instruments, the work in this connection has been very much augmented, the labour of correction and adjustment of deliveries being considerable, and much instruction and assistance has been given to instrument firms. A new air speed indicator of the metal diaphragm type has been designed and tested. Improvement has been made in the system of electric lighting of instruments. The National Physical Laboratory method of test of instrument dials painted with luminous paint has been of great assistance, and the test is now specified as standard by the Royal Aircraft Factory. The temperature and lag errors in aneroids are being investigated and their remedy considered. An improved engine speed indicator is designed and is under construction. The investigation relative to the aeroplane compass, already referred to, has led to the production of the R.A.F. Mark II Compass, which is now being made by contract in large numbers for the Royal Flying Corps.

"Two wireless telegraphy sets of very light weight have been designed and tested, and the investigations relative to finding the true vertical on aeroplanes in flight have progressed satisfactorily, as well as the evolution of optical systems for convenient observation of bomb dropping from aeroplanes.

"*Whirling arm.*—The whirling arm at the Royal Aircraft Factory has been used for tests of full scale air-screws, and modifications made to give speeds up to 70 m.p.h. The results have been valuable in studying the relation between model and full scale observations taken on aeroplanes in flight. Comparative experiments are also in progress at the National Physical Laboratory.

"*Fabrics and dopes.*—Experiments with various types of fabric have been in progress in connection with visibility and with a view to lowering the weight of the fabric covering of wings, and decreasing the amount of the tightening and protecting film necessary. It has also been found that a method of abandoning the use of poisonous ingredients can be relied upon. Protracted experiment has led to the conclusion that the greater part of the deterioration of the film on aeroplane wings is due to the actinic portion of the sun's rays, and it has been found that effective protection can be obtained by the application of a finishing varnish containing pigment, and that advantage is gained by the avoidance of drying oils in contact with fabric. The use of the pigment is also serviceable in certain cases in rendering aeroplanes, when on the ground, less visible from above.

"*Other matters.*—A large number of special tests have been made on oils and petrols, the design of magnetos, in which assistance has been given by experiments at the National Physical Laboratory, the design of spark plugs, the design of shell for special purposes, gun mounts, fire grapnel, &c., on thin tubular struts, on sound detection, on the stability of bombs, on the gas distribution in engines, the use of air-screws of variable pitch, and many other problems. A special speed measuring course has been laid out for determining aeroplane speeds at heights.

"NAVAL WORK.

"The assistance of the Committee has been given to the Air Department of the Admiralty in connection with a number of important problems, in which laboratory experiment was desired in conjunction with investigatory work proceeding on the full scale. Among the questions dealt with may be mentioned the design of airships, both rigid and non-rigid, the mooring of airships over the sea, points in connection with the design of seaplane-carrying ships, the design of wind screens near airship sheds, and the equilibrium and stability of kite balloons. The National Physical Laboratory has also been working in co-operation with the Air Department in relation to airship fabrics, dopes for aeroplane fabrics, the production of light alloys, and other matters.

"As mentioned earlier, a request was made by the Air Department of the Admiralty for an increase in the facilities for tests of seaplane floats and flying boat hulls. The necessary provision has been made for this, and the full scale work on machines of new types is being carried on in conjunction with model tests in the William Froude Tank at the National Physical Laboratory. The utility of the model work has been fully demonstrated in the full scale tests.

"New types of aeroplanes and seaplanes have also been developed by the Air Department, with the aid of wind channel tests at the National Physical Laboratory, and the co-operation of the Committee has been obtained with reference to a number of special matters, especially in regard to auxiliary apparatus for use on aircraft.

"METEOROLOGICAL WORK.

"The experimental work of the year has been mainly concerned with arrangements for the automatic recording of lightning flashes and ascertaining by wireless telegraphy the position of distant thunderstorms, with the object of giving warning of their approach to those interested. The Admiralty have arranged for the co-operation of the Naval Wireless Department, and the assistance of observers of weather in various parts of the country has been secured.

"The work at South Farnborough is in charge of Temporary Capt. C. J. P. Cave, of the Meteorological Section R.E., who is now meteorologist in charge of the Office at South Farnborough.

"Arrangements are in progress for observations on the relation of various conditions of weather to visibility of near and distant objects.

"In connection with the regular work of the Office at South Farnborough, information of various kinds as to the state of the atmosphere has been supplied to the Royal Aircraft Factory, information as to the structure of the atmosphere, as obtained by pilot balloons, to the Royal Flying Corps, the Aeronautical Inspection Department, and other centres.

"The Office is in regular daily communication with the central Meteorological Office at South Kensington, for the transmission of the observations made locally and for the receipt and distribution of information collected and arranged at the Central Office. It has also been used for training meteorologists for duty with the Meteorological Section R.E.

"There have been many changes in the professional staff, which now consists of Capt. Cave and Mr. R. A. Watson Watt, B.Sc., of University College, Dundee.

"Arrangements are in progress through Major G. I. Taylor, R.E., who has been appointed Professor of Meteorology, to improve the exchange of information between the air pilots and the Meteorological Service, and to enable the collected records of weather and the experience of airmen, which is at present unrecorded, to be used for the advantage of the Air Services.

"Signed on behalf of the Committee,
"June, 1916. "RAYLEIGH, President."

It may be recalled that the members of the Committee are :—The Rt. Hon. Lord Rayleigh, O.M., F.R.S. (*President*) ; Dr. R. T. Glazebrook, C.B., F.R.S. (*Chairman*) ; Mr. Horace Darwin, F.R.S. ; Mr. E. H. Tennyson d'Eyncourt, C.B. ; Sir G. Greenhill, F.R.S. ; Lieut.-Gen. Sir D. Henderson, K.C.B., D.S.O. ; Mr. F. W. Lanchester, M.Inst.C.E. ; Mr. H. R. A. Mallock, F.R.S. ; Lieut.-Col. Mervyn O'Gorman, C.B. ; Professor J. E. Petavel, F.R.S. ; Sir Napier Shaw, F.R.S. ; Commodore Murray F. Sueter, C.B., R.N. ; *Secretary*, Mr. F. J. Selby.

AIRISMS FROM THE FOUR WINDS.

How to stop Zepp. raids. Use this formula :—

$(A\ V\ \rho)^N$.

When N = some sensibly large number.

- - -

Then, when we've got them, send them over to the Zepp. bases and properly strafe the pirates in their lair.

- - -

The Admiralty are to be congratulated on their efforts at abbreviation. Probationary flight officer is certainly a little less of a mouthful than Probationary flight sub-lieutenant (temporary). Perhaps they will try again.

- - -

But what about the Parliamentary Air Committee's terminology : "Sea-birds" for naval seaplanes, "Land-birds" for Army aeroplanes.

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Both appellations, in our opinion, are thoroughly worthy of "the bird" ; and we fancy they'll have it !

- - -

Quaint idea for parliamentarians to set themselves this sort of task. There's plenty of energy in other directions wanted to keep the country at the top in the air, before they try and take the bread—at 9*d.* a loaf, too—out of the mouth of the poor etymological student. Why not ask "P.B." to join up and give them something in the way of rhetorical suggestions ?

- - -

If the brainy members of the Air Committee have been misreported, we hasten to ask pardon. Perhaps the real meaning is to be found in the following suggestion appearing in the *Spectator* :—

"They propose that the present clumsy and ugly system of designating aircraft by numbers and letters should be replaced by the names of birds. The machines would be grouped in classes, and each class would have a distinctive name. The names of sea-birds would be given to seaplanes and the names of land-birds to Army aeroplanes. Just as ships of war are grouped in the 'county' class, the 'river' class, and so on, the aeroplanes would be thrushes, blackbirds, tits, swallows or sparrows, and the seaplanes redshanks, cormorants, herring-gulls or guillemots."

- - -

Which idea has something quite pretty in it, possibly, for privately owned aircraft. But for service machines ! Well, in this case *we* will wait and see how it strikes others.

- - -

Did all the Parliamentary visitors to "one of the most important R.F.C. parks" last week enjoy their trips in the air on Government machines ?

- - -

Did one discover that a monocle is not a convenient medium for admiring the landscape when looping ?

- - -

Has he yet been convinced by other "hon. members" who were present that he did loop the loop ?

- - -

Petrol as a fuel for aero engines is, perforce just now, universally accepted.

- - -

Does it necessarily follow that petrol is likely to be always, or even for many years, the only fuel worthy of consideration ?

- - -

What about producer gas ?

- - -

Apparatus much too heavy ? Well, we are not so sure. In fact, somebody we know claims that the same power can be obtained, using the same old petrol engine, practically without alteration, for the same weight and about one-fifth more bulk.

- - -

Or, what about that elusive and evil-smelling stuff, ammonia ?

- - -

Will leak past any piston ring ever made, it is true, but why necessarily use piston rings ?

- - -

Unlike producer gas, ammonia is hardly likely to be used in an ordinary engine, but there may be—we do not say there will be—others. As for comparative power output, well comparisons are odious. Literally.

- - -

What does "A Naval Correspondent" of one or two of the dailies mean exactly in his little story about Britain's new airships ?

- - -

An airship which "certainly seems marvellously rigid" is not necessarily a rigid airship.

- - -

And anyway, what are the Editors about, and what about the Defence of the Realm Act ? It looks like a bout with the authorities for someone.

- - -

Besides, where is the giving out of the surprise packets to come in ?

- - -

With regard to the various civilian flying schools, the negotiations and arrangements entered into some time ago are now panning out to finality, and pupils will be forthcoming very shortly. As soon, in fact, as the civilian pupils now in training have qualified for their "tickets."

- - -

On a recent visit to Hendon we noticed that most of the *habitués* seemed to walk about with a stiff neck. On inquiry it transpired that this was contracted through trying to follow with the eyes a new 'plane recently emerged from one of the sheds. Well, she certainly is fast, and no mistake.

- - -

For all whom it may relieve :—

Oil of Assiduity 4 oz.
Liq. Erudition, Fort. 1 oz.
Spirit of Enterprise 2 ozs.
Ess. Application, Quan. Suff.

To be well rubbed in before the fire (gas). A splendid recipe for "Hendon crick" in the neck, caused through trying to follow the new speed machine doing circuits.

- - -

It was good to find Jack Cates aerodroming again last week-end, also to get a peep at those twinkling eyes behind his glasses. He no longer asks "How's your father," but gazes sadly at the unwound SHELL clocks. To ask him the time brings the reply that it is "just past L."

- - -

Those at Hendon who think Ruffy is building an airship are mistaken. It is an aeroplane.

- - -

Hope the collection for Osipenko will be a bumper, but could have wished it were to do something for him *post*-hospital days. To have to collect for necessaries ought not to be necessary.

- - -

The new London and Provincial Aeroplane Works in Colindale have still got the old name up, "London and Parisian Motor Garage." The firm's offices are still over the London and Provincial Bank. Quite a warren of s(i)miles.

- - -

Note.—The man who wrote the above is now chained down in the attic.

- - -

Wish to correct heading, "Development of Artificial Flight," in the *B.P. Magazine.* "Flight" *is* developing, but it is far from being artificial. You watch.

- - -

The cult of the little tractor scout is spreading.

- - -

Capitalists who do not want to be much higher than the second floor in aviation finance should stop thinking about "getting in." They should "get," and before *all* the ground floor claims are staked off.

- - -

The Zepp., the Lamb and the Rabbit. A story of retaliation.—Upon the occasion of the last Zeppelin raid on the East Coast the only damage done in a certain district was the killing of one lamb and one small rabbit. The farmer to whom belonged the field in which fell the bomb which killed the lamb and the rabbit, promptly organised an exhibition for the benefit of the British Red Cross, charged 6*d.* for admission to view the mutilated remains and the big shell hole, and thereby collected the handsome sum of £11.

- - -

Who said we could not build aero engines ? Anyway where does the Beardmore-Halford-Pulford combination come in ?

- - -

"B.-H.-P." also stands for brake-horse-power, and plenty of it, too.

- - -

There are now 300 loops to the credit of the L. and P.—or should it be Loo P ?—'bus.

Hats off to the Malay States. Including the 14 fighting machines given by the Sultan of Johore, all classes in the Malay Peninsula—Europeans, Malays, Chinese and Indians —have subscribed for 45 aeroplanes for the British Army since the outbreak of war.

* * *

What about the latest mess at the Central Flying School at Salisbury ?

* * *

No, not the kind *you* mean, but the one that was opened the other day with an "At Home"—sports, concert and dancing.

* * *

Journalism has, and still is, playing its part well in giving to the Services officers with valuable technical knowledge and training. Among those recently obtaining their "wings" in the R.F.C. is Second Lieut. R. E. Dangerfield, son of Mr. Edmund Dangerfield, of the Temple Press. Our congratulations to both father and son.

* * *

If the "tales" of the Grimsby fishermen—of the hide and seek behind artificially created clouds tactics of the Zeppelins over the North Sea—are not too highly coloured, these peripatetic prowlers may well be dubbed the "Squids" of the air for the future.

* * *

Having exhausted the toxic effects of the Hymn of Hate, the latest effort of the German Government is to try to persuade the German people that they are taking their revenge for what they call the Baralong case by sending Zeppelins to England. "Every time a Zeppelin appears the English are to remember the 'Baralong.'" So runs the legend.

Personals

UNDER the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriages and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Second Lieutenant **Henry Merrik Burrel Law**, R.F.C., who was killed on August 8th, aged 24, was the eldest son of Mr. and Mrs. H. K. Law. He was educated at Exeter School, and was a member of the O.T.C. Being employed on Government work, he could not obtain his commission until December, 1915. He went to the Front in July. His brother, Second Lieutenant C. L. G. Law, Suffolk Regt., was killed in Flanders last September.

The funeral of Second Lieutenant **Carryer**, East Yorkshire Regt. and R.F.C., who was accidentally killed on August 13th, took place at Leicester amid manifestations of great public sympathy. He belonged to a well-known Leicester family. A firing party and a military band attended, and officers and men of the R.F.C. walked behind the gun-carriage on which the coffin was placed. At the conclusion of the service volleys were fired over the grave.

Lieutenant **Edwin John Leslie Lonnen**, R.F.C., who was killed last week owing to an accident whilst flying at Dartford, was the only son of the popular comedian, the late Mr. E. J. Lonnen, whose name was so long associated with the Hollingshead Gaiety successes, he being contemporaneous with Miss Nellie Farren, Miss Kate Vaughan, Fred Leslie, &c. Lieutenant Lonnen was 27 years old. Resigning his position in the Bank of Chili, Mauritius, he returned to England and joined the H.A.C. Later he joined the R.F.C., and was appointed Lieutenant two months ago. He was buried with military honours on Saturday in his father's grave at Norwood Cemetery.

Wounded.

Captain **Stuart Grant-Dalton**, D.S.O., Yorkshire Regt., attached to R.F.C., wounded, belongs to a Somersetshire family, and was born in 1886. He became in 1906 a Second Lieutenant in the regiment mentioned, and attained to his present rank in October, 1914. For his services in the field he was recently awarded the D.S.O.

Captain **Edward Henry Petre**, Suffolk Regt., attached to the R.F.C., wounded, is the son of Mr. Francis W. Petre, and a great-grandson of the eleventh Lord Petre, who died in 1850. Born in 1881, he got a commission in the Suffolk Regt. as a Second Lieutenant in May of last year, and was promoted to be Captain in the following October. His father, who resides in Dunedin, New Zealand, is the heir-presumptive to the present Lord Petre, who is only two years old and succeeded to the peerage last September, his father, who was a Captain in the Coldstream Guards, having died from wounds received in action in France.

Married and to be Married.

The marriage of Captain H. **Colmore**, 7th Hussars, R.F.C., and Miss **Nina Gostling-Murray**, took place, quietly owing to the war, at the Memorial Church, Swythamley Park, on August 18th.

An engagement is announced between **Ruby**, only daughter of **Dartford Holmes**, of Huddersfield, and Flight-Lieutenant F. M. L. **Barr**, R.N., only son of Engineer-Commander E. Barr, R.N., and Mrs. Barr, of Mossgeil, Rainham, Kent.

Items.

Mr. **Wilfrid C. Ashley**, who has been elected chairman of the Parliamentary Air Committee, has represented Blackpool in the Commons in the Conservative cause since 1906. He is a great-nephew of the famous philanthropist, Lord Shaftesbury, and married the only child of Sir Ernest Cassel in 1901. He has served in the Ayrshire Militia, the Grenadier Guards and the Hants Militia, retiring with the rank of Major in 1903.

Mr. **Alan H. Burgoyne**, who has consented to act as secretary to the Parliamentary Air Committee, has long been interested in aeronautics, and consistent readers of "Flight" from No. 1 will doubtless recollect an illustrated description in our issue of November 27th, 1909, of two of his very practical and beautifully made models. He is a Unionist Imperialist and Tariff Reformer, and sat in the House in the interests of North Kensington since 1910. He founded the *Navy League Annual*, which he edited for five years. He is greatly interested in submarine work. Mr. Burgoyne has travelled extensively in all parts of the world, and once, when in Port Arthur, was mistaken for a spy and saw the inside of a Russian prison.

Information is now to hand of how Second Lieut. **Geoffrey Victor Randall**, R.F.C., whose death was announced in "Flight" on August 11th, met his end. A fortnight before he was killed he and his observer were attacked by four hostile machines. Lieut. Randall brought one enemy machine down, and kept the other three at a distance until he reached the British lines. Later he was attacked by eight hostile machines, shot through the head, and killed instantly. His observer climbed into the pilot's seat, and managed to get hold of the controls, when he was rendered unconscious by a shot. The aeroplane circled and grounded 400 yards from our front trenches. The observer was rescued by a padre and a sergeant under heavy fire. Lieut. Randall's squadron-commander writes :—"I am very cut up, and so is the whole squadron at losing him. . . . Twice lately I have brought his name before the proper authorities for brave and useful work, and only a few days ago I was ordered to convey to him the personal congratulations of the G.O.C., R.F.C., in the field." And again in another letter :—"He was overwhelmed with eight hostile machines, but all accounts agree that he went straight into the middle of them, and he would never have cared if it had been 18 instead of eight."

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *War Office, August 16th.*

"*Mesopotamia.*—On Sunday there was an aerial combat which resulted in a Fokker being brought to the ground behind the Turkish lines. The Turks twice attempted to salve the machine, but were driven off by our artillery fire, which also destroyed the Fokker.

"During Monday night the enemy's hangars near the Shumran bend were bombed by our aeroplanes, all of which returned safely."

General Headquarters (France), August 17th, 10 p.m.

"A German aeroplane was brought down behind our lines near Pozières."

General Headquarters, August 18th, 10 p.m.

"Yesterday a German flying machine was brought down in flames in our trenches as the result of a combat, and a second machine by our anti-aircraft guns.

"Enemy's billets were successfully bombed at various places by our aircraft."

General Headquarters, August 20th, 10.47 p.m.

"In spite of low clouds, our aircraft did very useful work yesterday in communicating with our advanced infantry. One of our aeroplanes, coming down to a low height, opened machine-gun fire very effectively on the enemy's infantry in their front-line trenches, and also on hostile reinforcements coming up communication trenches."

War Office, August 20th.

"*Salonica.*—Enemy aircraft have bombarded Jenikoi Gavalanci and Gugunci with small success."

General Headquarters, August 21st, 9.42 p.m.

"A hostile balloon was forced to descend by our gunfire.

"Our aeroplanes continue to bomb the enemy's billets with success, in addition to their work with our artillery. Yesterday one of our machines did not return.

"To-day hostile aeroplanes showed a little more enterprise than usual, and some ventured over our lines."

French. *Paris, August 16th. Afternoon.*

"In the night of the 15th and 16th enemy aircraft dropped some bombs on Belfort. There were no casualties."

Paris, August 16th. Evening.

"Our aeroplanes have bombarded enemy establishments at Nicolic and Volovech (near Lake Doiran), and the military centres at Strumnitza Station. Enemy aeroplanes bombarded an ambulance at Vertekop. One German machine came to earth in the Serbian lines, the two aviators being made prisoners."

Paris, August 21st. Evening.

"Our chasing aeroplanes to-day were engaged in numerous fights, in the course of which two enemy machines were brought down in the enemy lines, one in the region of Deniecourt and the other near Berny."

Russian. *Petrograd, August 15th. Afternoon.*

"At about 7 o'clock in the evening of August 14th a German Albatros appeared over the town of Nesvij. Staff Captain Kruten, who brought down an enemy aeroplane at Nesvij on August 12th, ascended with his machine (which is mounted with a machine gun) and engaged the hostile aeroplane. This he drove to earth after an engagement lasting several minutes. The German machine fell in the vicinity of the town of Nesvij. The wounded pilot and the observer were taken prisoners.

"In the morning of August 14th the aviators Lieutenants Deterichs and Prokofeiev undertook, with two hydroplanes, a clever raid on the enemy's aerodrome near Lake Agern, in Courland. Our aviators, notwithstanding the bombardment by anti-aircraft batteries and a counter-attack by seven German machines, not only dropped bombs successfully on the enemy's sheds, but boldly entered into an unequal fight which lasted more than an hour. Many bullets struck our machine, but happily not in vital parts. As a result of the fight one of the enemy machines was struck, turned over in the air, and, surrounded with smoke, fell to the ground. Two others, having received injuries, alighted on the sea. Our hydroplanes returned safely to their base."

Petrograd, August 17th. Afternoon.

"A Zeppelin flew over the region of Kemmern, west of Riga, and dropped a number of bombs."

Petrograd, August 18th. Afternoon.

"In the Baltic Sea, on the night of August 16th, a squadron of our seaplanes, under the command of Naval Lieut Lichine. made a successful flight over the enemy's aviation station near Lake Aughern. Bombs were dropped, and apparently caused great destruction. One of the enemy's hangars was wrecked, and fires broke out in several parts of the aviation station. Our airmen were subjected to a heavy fire from the enemy's anti-aircraft guns. The enemy sent up rockets and bombarded the machines with shrapnel, which, however, did not prevent our airmen from accomplishing their task and subsequently returning to their base without loss."

Petrograd, August 19th.

"In the region of the small town of Sokul an enemy aeroplane dropped over 70 bombs."

Petrograd, August 21st. Afternoon.

"In the region of Lubieszow, on the Stokhod, our artillery set fire to a German observation balloon."

Italian. *Rome, August 15th.*

"Enemy aircraft dropped bombs on Monfalcone, Ronci, San Canziano and Pieris. There were no casualties or damage.

"Our seaplane squadrons carried out this morning with success a bombardment of the Government workshops and the aircraft shed at Muggia, Trieste, creating in that industrial district many great fires. French chasing machines assisted in an aerial engagement, repulsing enemy seaplanes. All returned safely except one seaplane."

Rome, August 16th.

"A squadron of 14 Caproni aeroplanes, escorted by (French) Nieuport chasers, yesterday bombarded the railway and military establishments near the important stations of Prvacina and Dornberg. Ninety high-explosive shells (about 2½ tons) were dropped, and good results were observed.

"In spite of the heavy fire of numerous anti-aircraft batteries, our machines returned safely."

Rome, August 17th.

"A squadron of our Voisin aeroplanes bombarded the railway station of Reinenberg, on the line Gorizia–Trieste. Good results were observed, and the machines returned safely.

"Last night hostile seaplanes dropped bombs on Venice and on the Grado Lagoon. Some slight damage, but no casualties are reported."

Serbian. *Salonica, August 19th.*

"An enemy air squadron bombed the British ambulances at Vertekop. Six persons were killed. Nineteen Allied aeroplanes dropped 80 bombs on enemy hangars at Monastir. Excellent results were observed."

German. *Berlin, August 17th.*

"On the night of the 15th inst. our seaplanes again attacked with explosive and incendiary bombs the aerodrome of Papenholm, on the Island of Oesel (at the entrance to the Gulf of Riga) and enemy aeroplanes on the shore of the Island of Runo in the Gulf of Riga. Despite heavy anti-aircraft fire and a subsequent air fight, our seaplanes safely returned. The same night a raid by four enemy aeroplanes on Lake Angern caused only slight material damage."

Berlin, August 18th.

"German aeroplanes, together with a U boat, attacked Russian destroyers to the north-east of Kara Burnu, with success."

Berlin, August 21st.

"Off Ostend an English seaplane was destroyed by our fire and a French seaplane was shot down. In an air fight an English biplane was brought down south-east of Arras."

Austrian. *Vienna, August 16th.*

"On Monday night a squadron of seaplanes attacked Avlona. Direct hits on the coast battery, the barracks, camp, a storehouse and on a ship were obtained. Several fires broke out. All our seaplanes returned undamaged, despite a violent anti-aircraft fire."

Vienna, August 17th.

"In reply to the hostile air attack on Trieste, one of our air squadrons last night attacked Venice, where the railway station depôts, arsenal and military objects were abundantly pelted with heavy and light incendiary bombs. Many hits were obtained, and a great fire broke out in the railway depôts. A second squadron successfully attacked the harbour of Grado, a battery on the Lower Isonzo, and military objects at Monfalcone. Despite a very heavy anti-aircraft fire all our aeroplanes returned undamaged."

Turkish. *Constantinople, August 19th.*

"On the morning of August 2nd, under the protection of French destroyers, four aeroplanes from a British warship, which appeared off Haifa and attacked Aful (Carmel) and Magareth, dropping bombs and killing one child and wounding four persons, our artillery forced the aeroplanes to withdraw to the coast."

Bulgarian. *Sofia, August 19th.*

"A squadron of German aeroplanes early this morning attacked railway works near the village of Lanetschewo and the enemy camps near the villages of Karsovo, Gavaliantzi, Dragomirtzi and Kalabak, with good effect. All the aeroplanes returned to their base."

R.F.C.

THE following fourth *résumé* of incidents extracted from recent reports of the Royal Flying Corps in France was issued by the Air Board on August 16th :—

"July 20th.—At about 6.15 p.m. four of our aeroplanes encountered an equal number of Fokkers, accompanied by two biplanes. A fight which lasted for nearly three-quarters of an hour ensued. Eventually one of the Fokkers was driven down and destroyed; a second went away hard hit, and the whole formation was dispersed. Our machines returned undamaged, though one pilot was wounded.

"Between 8 and 9 p.m. an offensive patrol of four of our machines encountered a hostile formation of 11 machines, which included L.V.G.'s, Rolands and Fokkers. Our leading machine first dived at an L.V.G., which made off to the east, and then attacked and drove down a Fokker. It was then attacked by a Roland, but, out-manœuvring it, drove it down. Our second machine had meanwhile closed with another Roland, which was driven down out of control. In this combat two Fokkers, which were about to attack, nearly collided. Our third pilot, who was at a lower altitude, having disposed of a Roland, which fell in a spinning nose-dive, was attacked by a Fokker, and, in consequence of his engine having been hit, he was unable to out-manœuvre it. He therefore descended in a steep spiral. Our fourth pilot observing this dived to the rescue and engaged the Fokker at a height of 1,000 ft. above the trenches. The Fokker fell to the ground and burst into flames.

"Eventually all the hostile machines were dispersed. The destruction of the three hostile machines is confirmed by independent witnesses.

"July 21st.—Much successful co-operation with artillery was carried out; 92 targets were engaged with aeroplane observation and 25 with kite balloon. Several direct hits on gun emplacements were obtained, the ammunition in one continuing to explode for over half an hour.

"One of our machines, engaged on photographic duty, was attacked by a Roland, which came level and then dived and attacked under the tail of our aeroplane. Our aeroplane side-slipped till level with the Roland, and then fired three drums into it at 40 yards. The Roland fell to the earth near Leuze Wood.

"One of our aeroplanes, whilst on artillery patrol at 4,000 ft., saw eight hostile aircraft at a height of 9,000 ft. It climbed to this height and was joined by five of our fighting machines. At this juncture the enemy were joined by five L.V.G.'s and two Fokkers. Our machines all attacked the somewhat scattered enemy formation. A section of three of our machines dived on to one party, of which one Fokker plunged to earth from a height of 7,000 ft., and two other machines were forced to land. Another machine was seen to fall out of control into a village, and yet another fell headlong to earth in a field. The fighting lasted over half-an-hour, when the remaining enemy machines flew off in twos and threes.

"The total of hostile machines brought down on this day was six, and at least three more were driven down damaged.

"July 27th.—At 12.30 p.m. four of our bombing machines, armed with heavy bombs, set out to attack an important railway centre on the enemy's lines of communication, where large quantities of ammunition had recently been reported. East of the line clouds were below 5,000 ft., which considerably favoured the expedition. The bombing machines arrived over their objective between 2 and 2.30 p.m., and all four machines descended to heights of from 2,000 ft. to 4,000 ft. to drop their bombs. The station, which was crowded with rolling-stock, and the sheds, containing ammunition, were attacked. Both sheds and rolling-stock were hit, and fires were seen to be started at four different points by our pilots, who remained circling round.

"The expedition was practically unmolested by anti-aircraft guns or hostile aeroplanes, and all our machines returned safely and landed on their home aerodrome within four minutes of one another."

R.N.A.S.

The following incidents, extracted from recent reports of the Royal Naval Air Service, were issued by the Air Board on August 19th :—

"Our machines have maintained a steady offensive in Southern Bulgaria, which has had a most demoralising effect on the enemy. Places where the heaviest anti-aircraft fire was encountered have been singled out for special attention, with the result that our machines now fly over these places with little or no opposition. Much damage has been done to transport vehicles and their huts.

"Our machines have maintained a regular patrol of the Dardanelles, attacking with bombs and machine gun fire all enemy movements.

"On July 2nd two of our seaplanes proceeded on a reconnaissance over Haifa and dropped bombs on the bridge and wharf. One of the machines came to grief, and was observed half a mile from Acre drifting towards the shore in a sinking condition. The other machine thereupon landed a few yards from it and took aboard the pilot. As it was impossible to salve the machine it was fired at and sunk. The remaining machine then returned, carrying three persons, one sitting on the petrol tank.

"On July 21st one of our seaplanes, when at 11,000 ft., encountered a hostile biplane on the Flanders front. The British pilot dived on the hostile machine, which, in the meantime, was manœuvring for position under his tail, opening fire at the same time. The machines met nose on, both firing, and passed each other at 20 ft. range, our machine firing one tray. The hostile machine then turned and made for the coast. Our pilot followed, but owing to lack of petrol was forced to descend.

"On July 28th one of our machines sighted a hostile aeroplane returning towards Nieuport. Diving from 14,000 ft. to 10,000 ft., and manœuvring to get the advantage, our pilot opened fire at close range. Unfortunately, whilst the attack was being carried out, the machine experienced a strong concussion, and, getting out of control, dived steeply and dropped, spinning some 2,000 ft. The pilot with great difficulty eventually regained control of his machine and made a safe landing. The machine was found to have the whole upper surface of the left-hand upper plane and two-thirds of the right-hand upper plane stripped of fabric. This damage was caused by the explosion of a shell close to the machine."

A Raid by the R.N.A.S.

THE Admiralty issued the following announcement on August 19th :—

"At noon yesterday, the 18th inst., a successful attack was carried out by naval aeroplanes on enemy ammunition dumps at Lichtervede.

"Forty-eight bombs were dropped from a height of about 3,000 ft., and large fires were afterwards observed.

"All machines returned safely."

From Other Sources.

The *Daily News* Special Correspondent, writing from the British Headquarters on August 9th, says :—

"With the other War Correspondents, I have been given the opportunity to read the official reports of the operations of our flying men in the last part of the month of July. It is an amazing document. As I have said once before, there is material here awaiting Mr. Kipling as wonderful, as outrageously improbable, as anything which he found in the records of the submarines. And the miraculousness of it is heightened by the solemn official language in which the feats are described.

"It is almost sadly that the report states that on July 26th the enemy machines 'were quite inactive until late in the evening,' much as one might report that the fish were not biting well. Then, however, we cheer up, for 'a reconnaissance to Cambrai saw some 15 and had considerable fighting.' So the day did not pass entirely without sport. But it is the character of the fighting that moves astonishment.

"On July 27th, we are told, 'Captain B engaged several hostile machines, driving them off,' and the 'several' is delightful. On the same day 'Lieutenant C dived at five hostile machines which were attacking a B.E. between Le Sars and Martinpuich. All the hostile machines were driven off.' Two days later, 'Lieutenants D, U and S saw five Rolands on the attack and broke them up, scattering them in all directions.' Then 'Captain B' turns up again, being attacked by an enemy machine which he had mistaken for one of ours. He inconsiderately gets his side gun jammed, so he fires a drum from his top gun and bags the enemy. That he did bag him is only known from the report of another of our men, 'Lieutenant J,' who was watching and saw the enemy go down, Captain B himself being busy 'watching another machine.' It is often so, when the birds come too fast. 'Captain B' could hardly be expected to keep count of everything.

"And so the bewildering record goes, with tales—two lines long on the average—of the loveliest fighting against odds and of deeds up there above the clouds that shame us earthworms. We read how now and again the aeroplanes come down to 700 ft. and thereabouts and drop their bombs on horse transport moving along the roads or on columns of infantry. At such a height one almost expects to read that the enemy drove them off with stones and clods. We hear of them going to this town and that and bombing moving trains so that they blow up, and ammunition stores which continue exploding for an hour afterwards, the shocks being felt by our machines at a height of 9,000 ft., and villages used as billets which catch fire and burn until next day.

"Yet all this is not the main work which the airmen do. The bulk of the reports deal exclusively with the observation work for our artillery, and how good that is I have told several times. Here we have the record of the numbers of 'targets' that are 'registered' each day, and what happens to those unhappy targets when the guns get on to them.

"It may be remembered that one day I reported that the enemy's machines were showing signs of enterprise. It seems that on that day 'some 25 machines in all appear to have crossed short distances over our lines.' Among them they dropped one bomb in a wood. Then the record goes on:

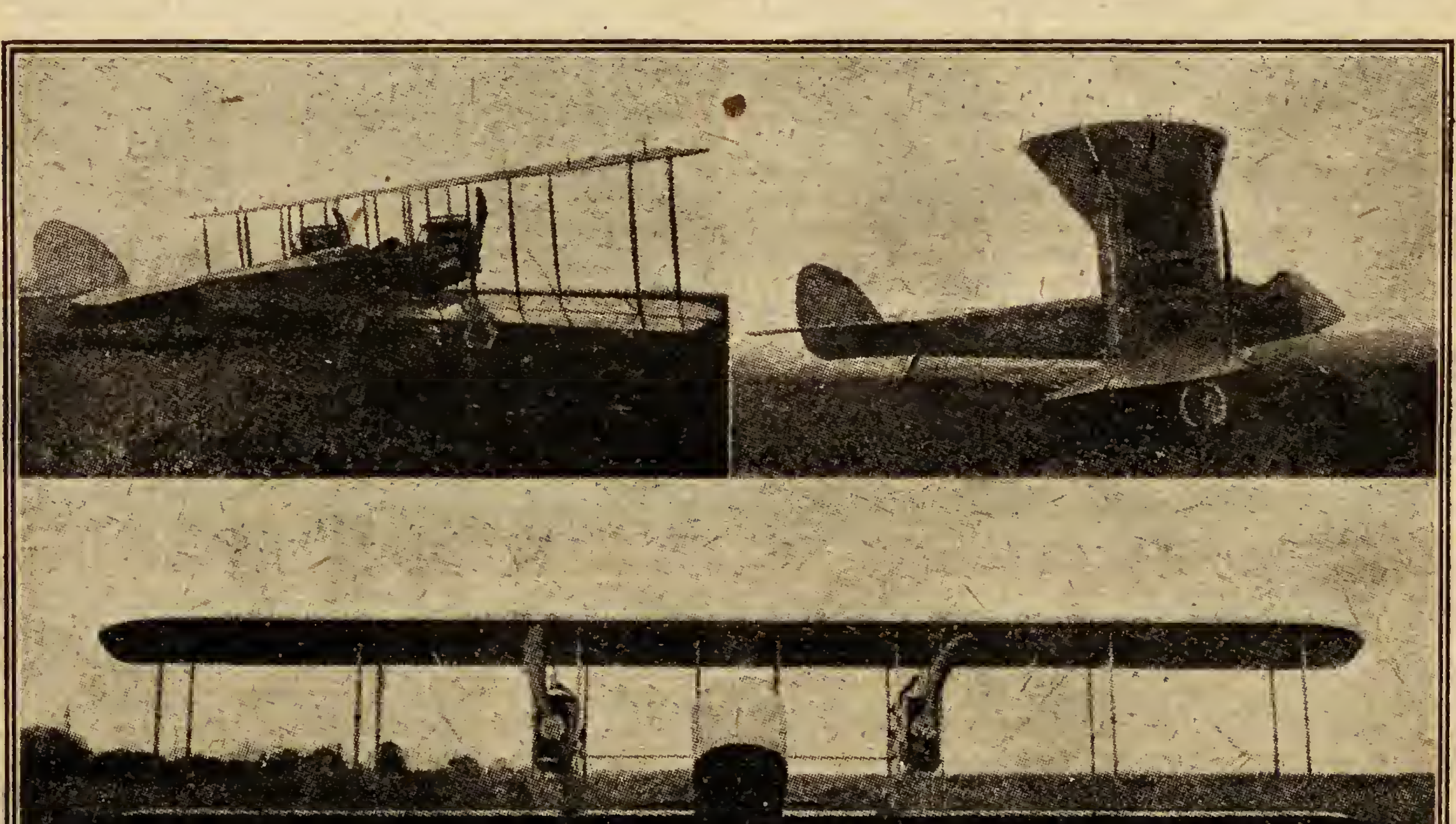
"'No decisive results of the fighting were seen, as the fights followed one another so quickly (too many birds again!). The fighting was all in our favour, however, and the enemy formations were in every case dispersed and driven off. Two of his machines are believed to have been destroyed, but there is no confirmation. Several were driven down.'

"But the gist of it all is in another sentence:—

"'The work of our Corps machines was not interfered with. The Corps machines just went on with their work, registering targets for the edification of the guns, and taking the photographs of the enemy's ground that show up every trench which he makes or little molehill which he throws up till it stands out as distinctly as a burglar in the light of a policeman's lantern.'

"It is an extraordinary document, which makes one most of all deplore the poverty of the human imagination which, before the coming of the aeroplane, could fashion nothing more thrilling as occurring in the air than futile flights on rocs' backs and magic carpets. What one deplores less is the extremely uncomfortable time which the enemy is having, not only in the air, but in all the region under the air over a large space behind his lines."

A Central News message from Amsterdam on August 10th says:—



THE LATEST AMERICAN "TWIN" BATTLEPLANE.—Built by the Atlantic Aircraft Co., it has a span of 48 ft., and a supporting area of 550 sq. ft. The chord and gap are 6 ft. and 7 ft. respectively, and the length is 28 ft. 6¾ ins. Two 90 h.p. Aeromarine engines are installed, and the speed range is 50-85 m.p.h. (*Photo. by courtesy of "Aerial Age."*)

"The Allied air squadron which flew over Brussels was composed of two monoplanes and five biplanes, and the goods station at Schaerbeek and the Zeppelin hangars at Evere were hit by several bombs. Happily, there was not a single Belgian victim to deplore."

The *Echo Belge* learns, in regard to the recent raid against Ghent, that the arsenal was bombarded with unusually large bombs. Eighty Germans were killed or wounded, and an extraordinary panic prevailed at the workshops. The effects of the bombardment were terrible. Portions of the roofs and walls of the buildings attacked flew high into the air, and when it was at length possible to approach the arsenal it was clear that it had been half destroyed.

An officer of the Royal Horse Artillery, writing to his mother in South Kensington, describes a thrilling air fight which took place a few days ago in France.

"The Huns came out, as they generally do, in a squadron of six machines," he says.

"We had six ready for them, and there was a tremendous amount of manœuvring for the best positions. Suddenly one of their Fokkers swooped down on to one of our old defenceless patrol 'planes, which was flying very low, but the latter, performing the most extraordinary antics in the air, managed to escape, although the Hun chased our man down to within 300 ft. of the British guns before giving up.

"The Hun then climbed and had risen to a fair height, when one of our fighters dived at him and fired, but his shots missed and he dashed past the Hun, who gave chase. Our man zig-zagged for position, but the German, who was blazing away with his machine gun, seemed glued to the Briton's tail. All of a sudden another of our fighters appeared; he seemed to nose-dive from the very skies. He caught the Hun, was behind him and then above him before the enemy could realise what was happening. The Hun tried hard to escape, and did a 'bank' towards his own lines, but our chap must have hit him, as he suddenly hovered and started volplaning slowly down. He would have escaped into his own lines, but as he crossed our trenches a furious rifle fire broke out and suddenly he dropped like a stone. Both our 'planes returned safely.

"So thrilling was the fight that the artillery of both sides stopped firing. All the gunners in the neighbourhood and all the supporting infantry got out of their shelters to watch. There was silence save for the noise of the three planes fighting, and when the Hun was brought down wild cheers broke out all along our line.

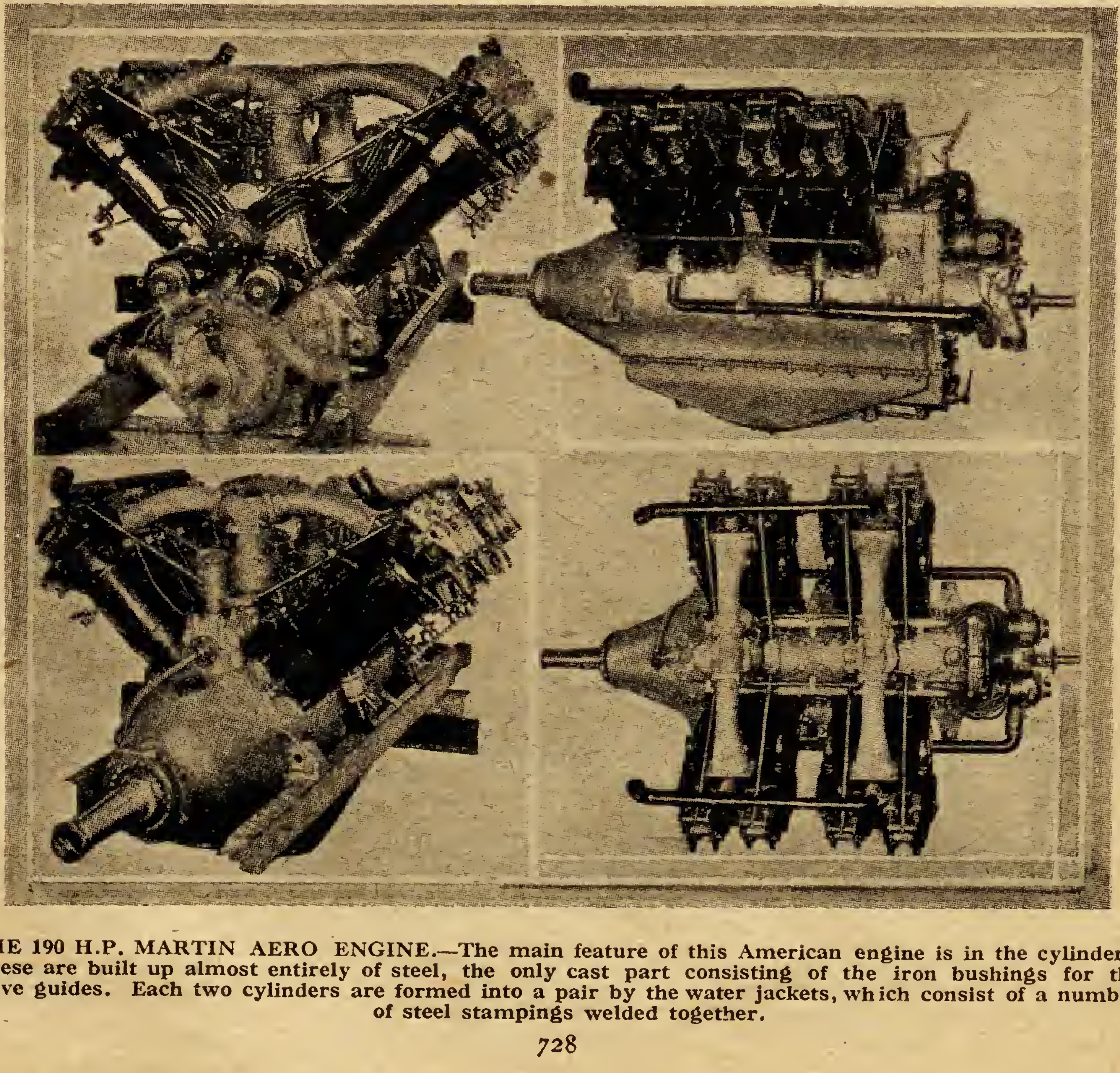
"When it was over both sides went back and bombarded each other more furiously than ever, just to make up for lost time."

A Reuter message from Cairo on August 13th says:—

"Our aircraft have done most excellent work, averaging 2,000 miles daily. Though our men flew low over the enemy's lines, no machines were lost. A most gallant feat was performed yesterday when one of our machines was hit and the pilot was observed to be seriously wounded. Nevertheless, he accomplished his task, and, returning safely to our lines, made a valuable report."

Mr. W. T. Massey, writing to the *Daily Telegraph* from Romani on August 12th, says, with regard to the retreat of the Turks:—

"They have destroyed a great quantity of stores, and were in the act of burying material when an aeroplane reported men digging beside camels, apparently intending to dump the



THE 190 H.P. MARTIN AERO ENGINE.—The main feature of this American engine is in the cylinders. These are built up almost entirely of steel, the only cast part consisting of the iron bushings for the valve guides. Each two cylinders are formed into a pair by the water jackets, which consist of a number of steel stampings welded together.

animals' loads in holes. Our artillery played havoc with the scheme."

Mr. A. Beaumont, writing to the *Daily Telegraph* from Milan on August 13th, says :—

"Indignation at the Austrian attack on Venice and the destruction of the historic church of Santa Maria Formosa by an Austrian aeroplane bomb is general in Italy. A despatch from Rome says that the news has been a shock even to the Vatican. It made a profound impression on the Pope, who immediately wired to Cardinal La Fontaine, Patriarch of Venice, asking him to telegraph particulars. It is believed the Pope will take the earliest opportunity of protesting against these crimes.

"Some months ago an Austrian aviator dropped printed warnings in the Venetian dialect over the city, which declared: 'If Gorizia is taken, then woe to Venice!' The Austrians have carried out the threat. To-day's *communiqué* reports a further aerial incursion over Venice, during which a bomb was dropped on the church of San Pietro di Castello, the dome of which took fire. Happily the flames were extinguished before they did any very serious damage."

The Frontier correspondent of the *Telegraaf* says that 10 Allied aeroplanes were seen above Zeebrugge on the evening of the 11th, and that the enemy fired at them vigorously.

Mr. Philip Gibbs, writing to the *Daily Telegraph* from the Somme front on August 11th, says :—

"What hope they had was in the guns behind them, and certainly, in spite of all the German guns we have knocked out by counter-battery work, and the fact that they have had to shift their ground from day to day owing to our ceaseless searchings for their emplacements with the aid of our aerial scouts, the bombardment that preceded the German assault was intense and formidable."

The *Daily Telegraph's* correspondent, writing on the evening of August 12th regarding the situation at Pozières, says :—

"Our aviators have been very active, and our gunners have accomplished a good deal of destructive bombardment of enemy works and artillery."

Lord Northcliffe, in his article dated August 13th from the Isonzo front, says :—

"In nothing is the disorganisation of the Austrian defence more clearly revealed than in the utter absence of aerial observation. During my whole visit to this front I have not seen an Austrian aeroplane or observation balloon. The Italian captive balloons float serenely in still air, directing the fire of their own batteries, but the Austrians appear to be firing blindly. The Italian heavy batteries are consequently able to do their deadly work undisturbed. Their shells search position after position, bursting with marvellous accuracy on selected points miles ahead, and crowning every ridge with dark clouds of smoke. . . .

"On finding, through prisoners, that the news of the Franco-British successes on the Somme and the sweeping Russian advance had been kept from the Austrian rank and file, and that newspapers had long been withheld from the men in the Austrian trenches, General Cadorna, with his customary shrewd alertness, had millions of little news sheets dropped from aeroplanes among the enemy. The news sheets are printed in all the principal languages of the Habsburg Monarchy."

An Exchange message from Athens on August 13th states that it is announced from Salonica that German aeroplanes yesterday bombarded Vertikop for the fourth time, dropping bombs on the hospital quarters.

The *Telegraaf* learns from the frontier that in the recent air raids on Belgium bombs were dropped on the station at Mons, Hainaut.

This was the second time the station had been bombed in a fortnight, and both times it was crowded with military trains. Especially at the first raid, even before the airmen had appeared, much confusion prevailed at the station, the officials having received orders and counter-orders, so that they did not know which trains were destined for the Somme and which via Brussels and Germany, presumably for the Eastern front. Wagons were destroyed by the air raid, and railway traffic was hampered for a long time, with the result that the arrival of much ammunition for the front was delayed. The German authorities are very uneasy about the raid. They immediately ordered searches and examination of documents in the town, presuming that there were foreigners who gave information to the enemy. The repeated air raids on Ghent, Zeebrugge, Evere and Mons have led to a still more rigorous limitation of traffic.

* * *

The Parliamentary Air Committee.

At a meeting presided over by Mr. Wilfrid Ashley, of the Parliamentary Air Committee, held at the House of Commons on August 16th, the following resolutions were passed :—

1. That in the opinion of this Committee, without prejudice to the question of a central air service, an Air Lord should forthwith be added to the Board of Admiralty, representative of the Naval Air Service.
2. That, in the opinion of this Committee, the method of designating Government aircraft exclusively by letters or numbers should be abandoned, and that different types should in future be grouped by classes, and each class given a distinctive name, such as "land birds" for Army aeroplanes, and "sea birds" for seaplanes—a method which will simplify the present designations.

M.P.s in the Air.

A large party of the Parliamentary Air Committee, on August 15th, paid a visit to one of the most important R.F.C. parks and saw a display of flying by Army officers, while a dozen or so availed themselves of an invitation to go aloft, and one or two indulged in a loop. They were much interested in a demonstration of a device which permits of a machine gun being fired through a four-bladed propeller without injuring the blades. Among those present were Mr. Wilfrid Ashley (Chairman), Lord Montagu of Beaulieu, Gen. Sir Ivor Herbert, Sir Alfred Mond, Sir H. F. Hibbert, Sir Edward Beauchamp, Sir Albert Spicer, Sir Edwin Cornwall, Messrs. Alan Burgoyne, J. M. Hogge, Shirley Benn, W. H. Dickinson, T. Davies, A. F. Bird, Rowland Hunt, R. Pearce, Robert Harcourt, Col. Pryce-Jones, L. Haslam, C. G. C. Hamilton, J. F. Rawlinson, K.C., Basil Peto and Hay-Morgan.

The Great War Film.

The British and French official war film now showing at the Scala, the Philharmonic Hall and other halls in London, should be seen by everybody. Unfortunately there is no much of an aviatic nature portrayed, for, with the exception of the ascent of one of the "sausage" observation balloons taken at close quarters, and another picture showing two of these highly efficient "eyes of the Army" in the distance, no aeronautical pictures are shown. One sees, however, our Army at work under real war conditions, and in every phase of the life on active service. Only one picture is a bit gruesome, that showing our brave fellows going "over the top," yet withal raising such enthusiasm in the onlooker as to make him wish to raise his hat to every wounded soldier he meets. Our Army is magnificent, and a taste of the film now being shown must bring home the realities of what war actually means to the least impressionable imagination.

Eyes of the German Fleet.

That the German fleet in their peep out of Kiel on Saturday morning were warned in time to bolt by Zeppelins of the strength of the British Fleet, is indicated by the reports of trawlers arriving at Ymuiden that they sighted two Zeppelins with a squadron of German warships steaming W.N.W.

Zeppelins and Trawlers.

The mate of the Hull trawler "Endymion" has reported that, when fishing 18 miles off Flamborough Head on Saturday morning, a Zeppelin, L21, four times tried to bomb the trawler, but by cutting away the gear the trawler managed to escape. It was stated that the airship appeared to emit a cloud of smoke behind which it could hide.

Two Grimsby trawlers also reported an attack by three Zeppelins, which came down to 300 ft., but failed to hit the vessels with their bombs, although the bombs "exploded so close to the vessels that they were practically lifted out of the water." Sounds like pretty poor "shooting" anyway. But perhaps the proposed victims were not over expert judges of altitude.

Fatal Accidents.

The death of Flight Sub-Lieut. H. Pearman, R.N.A.S., was inquired into at Aldershot on August 16th. It was shown that on August 13th he was sent to pilot a new machine, and when concluding a trial flight the engine stopped. The machine then side-slipped and struck a tree. Apparently the petrol tank was damaged, as the machine burst into flames as it struck the ground. Deceased was alive when taken from the machine, but he died from his injuries soon after admission to hospital. A verdict of "Accidental Death" was returned.

At the inquest on Lieut. E. J. L. Lonnen, R.F.C., who met with a fatal accident on August 14th, it was stated that the deceased pilot apparently tried to turn the machine when only 150 to 200 ft. from the ground. It nose-dived and crashed to the ground, Lieut. Lonnen being killed immediately. A verdict of "Death from Misadventure" was returned.

An inquest was held at Nottingham on August 15th relative to the death of Lieut. Carryer, R.F.C. It was stated that he had received permission to fly to Leicester to visit his brother, but he lost his bearings and came down near the River Trent. On restarting, after crossing the river very low, the machine collided with a building and fell to the ground in flames. Lieut. Carryer was terribly burnt, and died two hours later in hospital. A verdict of "Accidental Death" was returned.

Two Famous French Pilots Killed.

During the past few days French aviation has lost two of its most famous pre-war pilots. Lieut. Marc Bonnier, who in November and December, 1913, and January, 1914, accomplished the journey in stages from Paris to Alexandria via Carlsruhe, Vienna, Budapesth, Constantinople, Jerusalem and Cairo on a Nieuport monoplane, was killed on the Russian front, but details as to how he met his end are lacking.

Second Lieut. Brindejonc des Moulinais, who met his death in the neighbourhood of Verdun owing to the collapse of his machine, was well known in England, as after flying from Paris to London in 1913 he competed in several events at Hendon. It may be recalled that he won the race for the Geisler Cup at Hendon, but was disqualified for flying over London, contrary to the regulations. His most famous trip was that from Paris to Warsaw with a stop at Berlin on June 10th, 1913, after which he flew on to Dunsburg, Petrograd, Reval, Stockholm, Copenhagen, The Hague and so back to Paris. Other notable aerial journeys by him were from London to Paris via Calais and Brussels, Paris to Madrid and back, and from Paris to Attendorn, in Westphalia.

Wright Co. Amalgamate with Martin.

From New York comes the announcement that the Wright Co. and the Glenn L. Martin Co., of Los Angeles, Cal., have amalgamated under the name of the Wright-Martin Aircraft Corporation. The president will be Mr. Edward M. Hagar, president of the Wright Co., while Messrs. Glenn L. Martin and C. S. Jennison will be vice-presidents. The new concern will comprise the Martin factory at Los Angeles, which is said to be turning out 10 aeroplanes a month; the Wright factory at Dayton, O., which will continue its experimental work; the Simplex Automobile Co., which is turning out aero engines and cars at its factory at New Brunswick; the Wright Flying Field, Inc., at Mineola, Long Island; the General Aeronautic Co., which handles the foreign business of the Wright Co. Apart from the building of Simplex motors, it is stated that the firm have the right to build the Hispano-Suiza motor in the States.

The Central Aircraft Co.

Continued expansion of the aircraft department business of Mr. R. Cattle has at length necessitated that it should be run separately. New works have been taken at Kilburn, and under the style of the Central Aircraft Co., Mr. Cattle has transferred this department from 27, Wybert Street, to Palmerston Works, with offices at 179, High Road, Kilburn, N.W. All communications and orders in connection with aircraft matters should therefore now be addressed to 179, High Road, and note telephone number: Hampstead 4728.

The business will remain under the same proprietorship and management, the only alteration being that the new accommodation will enable greater and quicker deliveries to be made, and it is almost needless to add that with the improved facilities every effort will be made not only to maintain the very high standard of material and workmanship for which the firm has justly made such a good name, but, if it be possible, to even improve upon it.

Flying at Shepherd's Bush.

A fine exhibition of flying and looping-the-loop took place last Saturday at Shepherd's Bush in connection with a Sports Day organised by Messrs. Waring and Gillow, Ltd. These exhibitions were carried out, through arrangement with the Whitehead Aircraft Co., by H. Sykes on the Martinsyde. He left Hendon Aerodrome at about 5 o'clock with a lady passenger who had never been up before. On arriving at his destination he put up a great variety of stunts, much to the delight of the spectators below, to say nothing of that expressed by his lady passenger.

Sports, &c., at Upavon.

Over 2,000 people accepted the invitation of Colonel MacLean, the Commandant, and the Officers of the Central Flying School, to attend the C.F.S. sports, tea, concert, and dance on August 16th. The programme comprised races and gymkhana events, including pillow fight, bicycle musical chairs, and an obstacle race. Mrs. MacLean presented the prizes to the successful competitors. During the evening there was a fine display of looping, diving, and spiral descents by Service pilots.

PUBLICATION RECEIVED.

General Specifications covering Requirements of Aeronautic Instruments. Report No. 8. Washington, U.S.A.: National Advisory Committee for Aeronautics.

NEW COMPANY REGISTERED.

BRITISH AERO MAGNETO MANUFACTURERS' ASSOCIATION, LTD.—A company limited by guarantee, with 20 members, each liable for £1 in the event of winding up. Object, to promote and protect the interests of manufacturers of aeroplane and airship magnetos in the United Kingdom, to promote the consideration and discussion of subjects affecting such manufacturers, to conduct and assist in experiments and researches for the purpose of improving aero magnetos or of producing improved machines or contrivances, &c. Members must be *bona fide* British manufacturers of aero magnetos or their authorised representatives. The first members are the British Thomson-Houston Co., Ltd., the M.L. Magneto Syndicate, Ltd., Nicole, Nielsen and Co., Ltd., The Thomson-Bennett Magnetos, Ltd., P. F. Bennett, E. Garton, C. A. Lister and R. B. North. All other candidates are to be elected by the company. The subscription for the first year is £25 per member, afterwards as the company shall decide. The subscribers are: W. C. Lusk, 83, Cannon Street, E.C., director of the British Thomson-Houston Co., Ltd.; D. K. Morris, Victoria Works, Coventry, director of the M.L. Magneto Syndicate, Ltd.; C. H. Kirby, 14, Soho Square, W., director of Nicole, Nielsen and Co., Ltd.; B. Steeley, Arden Works, Cheapside, Birmingham, director of Thomson-Bennett Magnetos, Ltd.; P. F. Bennett, Ardencote, Four Oaks; E. Garton, Tralee, Kenilworth; C. A. Lister, Sneyd Park House, Sneyd Park, Bristol; R. B. North, St. Wilfrids, Hagden Lane, Watford.

Aeronautical Patents Published.

Applied for in 1915.

Published August 24th, 1916.

8,583. W. H. Bloomfield. Aiming device for use on aircraft.
17,434. A. W. Judge and Varioplane Co. Propellers for aircraft.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

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As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

A JUSTIFYING note of his views appears in our Correspondence column this week from Mr. Prevost Battersby, in reply to our editorial comments a fortnight back, upon his Counsel of Perfection, to be attainable by the total suppression of flying after the present war has run its course. Whilst repeating the fact that we have the very highest admiration for Mr. Battersby's journalistic work notably in connection with the trench work of the British and our Allies, and that we in every way sympathise with the high human ideals which he has set out to engender in the civilised nations, we are afraid his present communication carries us no further, any more than his letter to the *Observer* of August 20th supplied a point which, followed to its finality, could be said to carry conviction with it, as to the possibility of his views being accepted. As we have already stated, human nature is the crux of the whole business, and so long as that very mixed quantity remains at its present standard there can be not the remotest hope of such a far-reaching and vital weapon as aerial navigation being ruled out of consideration as a factor in any future conflict between nations which the world will have to suffer in the life of coming generations. Its very effectiveness to inflict dire mischief and swift disaster upon the enemy, will be ever the justification for its elaboration by those very barbarians whose uncivilised and unlawful use of it in war is the main cause of Mr. Battersby's campaign for its suppression. What we claim is that whatever laws, international or otherwise, are made, they would be unhesitatingly trampled upon by Germany the moment it suited her. Of this self-evident fact the civilised world has had, we think, over-sufficient and convincing evidence during the past two years. For example, take Mr. Battersby's own point as to the banning of explosive bullets by international agreement. Germany, by authoritative accounts to hand, has not hesitated to employ these, not only in the African campaigns, but also against her European enemies. Again, there is the initial and great crime of all, the sacredness of Belgium's neutrality, which was solemnly agreed to, but blatantly violated the moment occasion arose to the presumed advantage of Germany. As to the suggestion of our correspondent, in support of the possibility of his argument being sound, that if we used

The Banning of Aerial Navigation.

our knowledge to spread bubonic plague or any other pestilence through the Central Powers, an emphatic protest, not to say action, would be made by the United States, we do not doubt that such protest would be promptly forthcoming against Great Britain. It is a little weakness the President has, although, if their official action were the same as in the case of the Central Powers, the chances are that we should hear nothing about even so ghastly a crime as that.

The crux of the whole question, therefore, resolves itself into the remote possibility—not probability—of the germanic barbarian respecting even in the smallest iota any undertaking or convention to which the Kaiser's Government may subscribe its support. What value can be attached to the Hun beast's word of honour, in the individual German and in official circles, has just been again brought into prominence in America itself, wherefrom the setting right of everything in the world is to emanate. This little matter of where a German's "word of honour" stands is well summarised in the following extract from a New York correspondent's telegram last week to one of our leading morning papers. He says :—

> "Germany's 'word of honour' is the topic of much ironical and bitter comment in the American Press. It arose from the statement of Herr Zimmermann, Germany's Foreign Under-Secretary, who explained to Mr. Gerard that the fourteen members of the crews of the interned ships 'Kronprinz Wilhelm' and the 'Eitel Friedrich,' who broke their parole and escaped from American custody, are really honourable citizens; they merely considered that the 'pledge they gave was not precisely the same as their word of honour.'
>
> "Apart from the discussion, which leaves a disagreeable impression upon Americans regarding the untrustworthiness of Germans, the chief result attained here by the flight of the fourteen 'honourable' citizens is the enforcement of strict regulations regarding those still interned, not to forget the photographing of prisoners, against which Count Bernstorff once objected, on the ground that a German officer's word was as good as his bond, and that such photographing 'would be a disgrace to Germany.'"

Is it likely, therefore, that the world's civilised nations, with the experience which has cost us and our Allies so dearly, will ever allow the Central Powers such a chance to develop in secret so formidable a weapon against our nation's welfare, as the prohibition of flying in the future would invite? We think not; and almost every argument put forward by Mr. Battersby in his letter to the *Observer*, already referred to, carries with it but a more convincing conviction than before that the only course for us to adopt is, whilst drawing the net as tight as possible on the Hun's future freedom of action in every direction, for us to be the paramount power in the air. Any other way simply leaves it to Germany to agree—and forthwith set every energy to work to equip herself for a second "Tag," which she would no doubt make a little more certain did not go astray, as has her present bid for dominion of the world's affairs. If an added testimony were required to point the German moral of German immorality, there is the Huns' "manifesto," which curiously was printed in our contemporary, side by side with Mr. Battersby's letter. From this it appears a German aviator was flying over a French town on August 5th and was seen to be throwing papers from his machine. One of these was caught by Coy. Sergt.-Major Marks, of the A.S.C., formerly organist at the parish church at Hale, Farnham, Surrey. The paper proved to be a manifesto in French addressed to the people of France. It called attention to the bombardment of towns in Germany, and went on :—

> "Your aviators did not make a mistake. Chance has permitted us to know the source of these crimes. We know to-day without the least doubt that they have been committed on the express order of your Government. It is your President Poincaré himself who suggested that order, and he is not ashamed to have listened to the base instigation of the English.
>
> "Germany makes war on the French armies, not on the civil population, on women and on children. She hopes that these explanations will suffice to prevent new barbarous attacks of this kind by the French squadrons. If it happens again Germany will find herself forced to take similar measures in order to defend herself.
>
> "But you will know then, Frenchmen, that that slave of England, Monsieur Poincaré, will be responsible for the bloodshed of innocent victims, and that it is English barbarism which has obliged us to carry destruction and mourning into your towns far behind the front."

Comment would be superfluous in view of the facts as we know them; therefore, whilst fully appreciating the sound motives at the bottom of Mr. Battersby's counsel of perfection, we are afraid his efforts, like many another man's previously in the same direction, will be wasted in trying to beat the air in more senses than one.

◆ ◆ ◆ ◆

Further Honours for the R.F.C.

In a supplement to the *London Gazette* issued on August 25th, it was announced that His Majesty the King has been graciously pleased to confer the Military Cross on the under-mentioned officers in recognition of their gallantry and devotion to duty in the field :—

Second Lieut. JAMES HECTOR ROSS, R.F.C., Special Reserve.

On two occasions he carried out reconnaissances at a very low altitude to determine the general situation. His machine was repeatedly hit by rifle fire, and he was severely wounded in the arm. His reports were most valuable.

Temporary Lieutenant A. H. SMITH, Lincoln Regt. and R.F.C.

For most gallant and skilful work in connection with artillery. In one instance, flying at 1,000 ft. under heavy fire, his information led to the destruction of two enemy batteries. On another occasion he flew under clouds for two hours at 600 ft., sending down information. His machine was repeatedly hit. He has set a fine example.

Lieutenant FREDERICK GEORGE ERNEST SUTTON, Can. Inf.

As Observer with Second Lieutenant Ross, he carried out two reconnaissances at very low altitude. Their machine was repeatedly hit by bullets, and the pilot was severely wounded in the arm. The reports rendered were most valuable.

Lieutenant R. H. C. USHER, Wilts. Regt. and R.F.C.

For conspicuous gallantry and devotion to duty in attacking three hostile machines and driving them off. On another occasion he fought five hostile machines, and although hit in the leg, continued to fight till his engine stopped. He succeeded under great difficulties in reaching an aerodrome, where he collapsed through loss of blood.

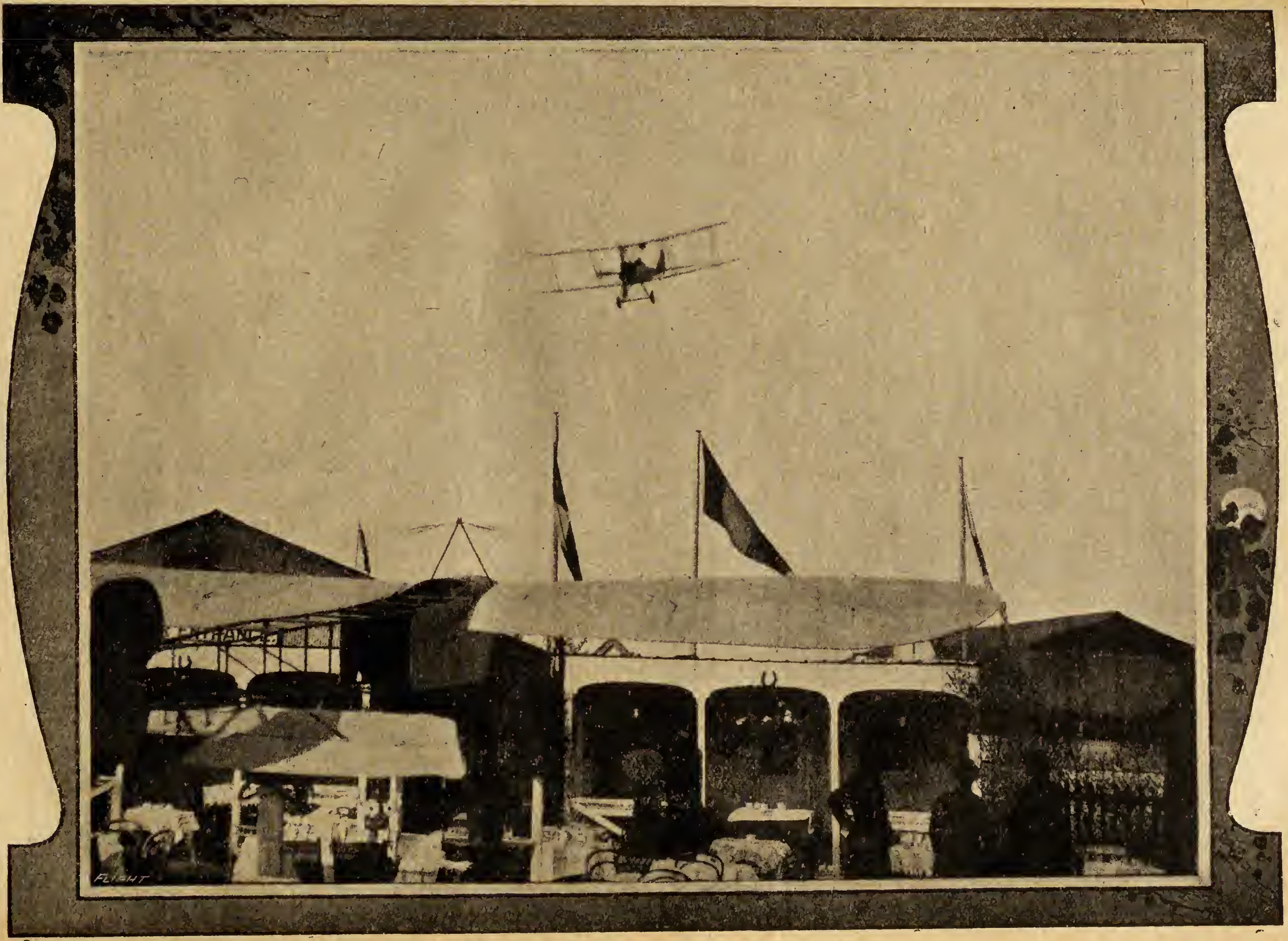
R.N.A.S. Raid on Airship Sheds.

THE Admiralty issued the following announcement on August 26th :—

> "Early yesterday morning (25th) an attack was carried out by naval aeroplanes upon enemy airship sheds near Namur. The sheds were successfully bombarded and two of them hit, but, due to low-lying clouds, it was not possible to observe the amount of damage done. One of our machines has failed to return."

Aviation in the States.

AT last the United States appear to be waking up to the importance of aviation. Congress has voted $13,281,666 for military aviation and $3,500,000 for naval aeronautics, while the sum of $200,000 has been ear-marked for the provision of a flying ground, which is to be selected by a committee of Army officers.



AT HENDON.—In 19——, it may be that pilots will *vol plané* into Mitchell's tea gardens for the cup that cheers. The one shown was probably only on a reconnaissance trip. The Blériot, in the shade of whose wings the tables are set, is that of the late G. Lee Temple.

The British Air Service

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of August 22nd :—

Probationary Flight Sub-Lieutenant (Temporary).—G. H. Porter granted a temporary commission as Sub-Lieutenant (R.N.V.R.), seniority Aug. 21st.

The following appeared among the Admiralty announcements of August 23rd :—

Air-Mechanic (1st Grade).—R. W. Berridge, entered as Probationary Flight Sub-Lieutenant (Temporary), seniority Aug. 27th.

The following appeared among the Admiralty announcements of August 24th :—

The under-mentioned have been entered as Probationary Flight Sub-Lieutenants (temporary), and all appointed to "President," for R.N.A.S., seniority as follows: F. R. Johnson, July 19th; R. A. Blyth and J. R. Allen, both July 20th; W. L. H. Pattison, E. J. Webster, J. R. Allen and W. S. Rope, all Aug. 27th; S. F. H. Herapath, Sept. 3rd.

The following appeared among the Admiralty announcements of August 25th :—

Mr. C. Saunders (O.S., R.N.V.R.) entered as Probationary Flight Sub-Lieutenant (Temporary), seniority Aug. 22nd.

The following appeared among the Admiralty announcements of August 26th :—

The under-mentioned have been entered as Probationary Flight Sub-Lieutenants for temporary service, seniority as follows: L. F. W. Smith, J. R. Booth, J. J. Malone, R. M. Keirstead, J. A. Morell and S. E. Ellis, all July 6th; and R. V. Power, Sept. 3rd.

The following appeared among the Admiralty announcements of August 28th :—

Lieut. (Canadian Engineers) N. M. Scott entered as Probationary Flight Sub-Lieutenant (temporary), seniority Aug. 27th. Mr. G. St. B. S. Watkins granted a temporary commission as Lieutenant (R.N.V.R.), seniority Aug. 26th, and appointed to "President," additional, for R.N.A.S.

The under-mentioned temporary entries have been made, seniority as follows: Lieutenants (R.N.V.R.): A. R. Dresser and H. E. Shaw, Aug. 26th; and A. J. Roberts, Aug. 30th. Sub-Lieutenants (R.N.V.R.): L. J. Rogers, Aug. 26th; and all appointed to "President," additional, for R.N.A.S.

Royal Flying Corps (Military Wing).

THE following appeared in the *London Gazette* of August 22nd :—

Squadron Commanders.—From Flight-Commanders, and to be Temporary Majors whilst so employed :—Aug. 1st,

THE KING'S RECENT VISIT TO THE FRONT.—R.N.A.S. officers being inspected by His Majesty. (*Official Press Bureau photo.*)

1916: Capt. F. W. Smith, S. Mid. Brig., R.F.A. (T.F.); Capt. M. G. Christie, Special Reserve; Temporary Capt. E. D. Horsfall, General List; Second Lieut. (Temporary Capt.) R. G. Blomfield, 5th D. Gds.; Lieut. (Temporary Capt.) L. A. Pattinson, R. Fus.; Capt. H. R. Nicholl, Special Reserve; Second Lieut. (Temporary Capt.) A. T. Whitelock, Special Reserve.

Flight-Commanders (*from Flying Officers, and to be Temporary Captains whilst so employed*).—Aug. 1st, 1916: Lieut. C. D. Fuller, Special Reserve; Lieut. A. C. Horsbrugh, Special Reserve; Lieut. A. G. L. J. Miller, I. Gds.; Lieut. D. C. Rutter, R. Suss. R., Special Reserve; Lieut. C. F. Collett, Special Reserve; Temporary Lieut. A. M. Lowery, General List; Second Lieut. L. Moss, A.S.C.; Second Lieut. N. G. McNaughton, Special Reserve; Second Lieut. J. W. Jardine, from a Balloon Officer, and to be Temporary Captain whilst so employed. Second Lieut. S. G. Hodges, Wilts. R., from a Flying Officer, and to be Temporary Captain whilst so employed; Lieut. H. B. Davey, N. Staff R. (T.F.), from a Flying Officer, and to be Temporary Captain whilst so employed; Aug. 10th, 1916.

Equipment Officers.—From Assistant Equipment Officers:—July 1st, 1916: Capt. W. E. G. Statter, R. Lanc. R., Lieut. E. R. Bond, General List, and to be Temprary Captain whilst so employed. Aug. 1st, 1916: Temporary Capt. E. B. Palmer, A.S.C.; Second Lieut. C. G. Tucker, Special Reserve, and to be temporary Captain whilst so employed; Temporary Second Lieut. R. S. Witchell, General List, and to be Temporary Captain whilst so employed.

Experimental Officer (*graded as an Equipment Officer*).—Temporary Capt. G. M. B. Dobson, General List, from an Assistant Equipment Officer; June 2nd, 1916.

Flying Officers.—July 28th, 1916: Capt. C. L. M. Scott, N. Staff R., Special Reserve, from a Flying Officer (Observer); Temporary Lieut. G. W. Gathergood, Durh. L.I., and to be transferred to the General List; Lieut. C. G. Beatson, Midd'x. Regt., Special Reserve, from a Flying Officer (Observer); Second Lieut. S. G. Howard, Special Reserve; Temporary Second Lieut. O. B. W. Wills, General List. Second Lieutenants, Special Reserve: J. Fairbairn, H. J. Gibson, D. E. Nicolle, G. F. Hughes. Temporary Second Lieut. P. S. Joyce, General List. July 30th, 1916: Lieut. P. C. Sherran, 26th Canadian Inf. Battn.; Second Lieut. J. B. Home-Hay, Arg. and Suth'd. Highrs (T.F.).

Assistant Equipment Officers.—Capt. E. F. Hirtzel, Welsh R., Special Reserve, and to be seconded; July 20th, 1916. July 21st, 1916: Temporary Second Lieut. M. O. Illingworth, General List. Second Lieut. W. A. Verner-Furlong, Special Reserve.

Memorandum.—Air-Mechanic J. H. P. Kither, from R.N.A.S., to be Temporary Second Lieut. for duty with R.F.C.; Aug. 8th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: P. V. Tanner, S. A. Harding, F. J. Miller, C. F. Blunt.

A. Meyrick to be Second Lieutenant; July 27th, 1916.

To be Second Lieutenants (on probation):—Aug. 8th, 1916: E. O. Lord, A. Coningham. Aug. 10th, 1916: G. M. Turnbull, W. C. Campbell, D. T. Steeves, J. C. Rimer. Aug. 12th, 1916: H. Cockroft, J. R. F. Gubbin, J. M. Roy-Edward St. Amory, R. E. Nowell.

The following appeared in a supplement to the *London Gazette* issued on August 23rd:—

Equipment Officer.—Second Lieut. O. V. Thomas, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed; July 7th, 1916.

Flying Officers.—Second Lieut. W. H. K. Copeland, City of Lond. Yeo. (T.F.); July 11th, 1916. Lieut. C. J. Brookes,

THE KING'S RECENT VISIT TO THE FRONT.—King George about to pin on decorations awarded to members of the R.N.A.S. in Belgium. (*Official Press Bureau photo.*)

Australian Flying Corps; July 12th, 1916. Second Lieut. (Temporary Capt.) G. O. Brunwin-Hales, Essex R. (T.F.); July 13th, 1916. Second Lieut. F. J. Miller, Special Reserve; July 14th, 1916. Second Lieut. (Temporary Lieut.) W. A. Shirlaw, High. L.I. (T.F.); July 29th, 1916. Second Lieut. W. R. B. McBain, R.F.A. (T.F.); July 30th, 1916. July 31st, 1916: Lieut. L. R. Andrews, 54th Canadian Inf. Bn.; Second Lieut. G. L. Castle, R.A., and to be seconded; Second Lieut. F. L. Royle, Yorks. L.I. (T.F.); Second Lieut. E. Laurie, Special Reserve; Temporary Second Lieut. R. G. Hornby, General List; Second Lieut. N. A. Phillips, Special Reserve; Second Lieut. P. V. Tanner, Special Reserve; Aug. 1st, 1916. The appointment of Temporary Second Lieut. L. S. Weedon, notified in the *Gazette* of July 18th, 1916, is ante-dated to June 12th, 1916. Temporary Second Lieut. T. W. L. Saunt relinquishes his appointment; Aug. 4th, 1916.

Assistant Equipment Officer.—The appointment of Second Lieut. A. C. Blackmore, notified in the *Gazette* of July 29th, 1916, is cancelled.

Adjutant.—Temporary Lieut. A. J. Child, Lond. R. (T.F.), from a Flying Officer (Observer), vice Capt. G. J. L. Stoney, Worc. R.; May 26th, 1916.

Memoranda.—Warrant and N.C.Os. to be Temporary Second Lieutenants (on probation), for duty with the R.F.C.:—July 25th, 1916: Act. Sergt.-Major D. B. Cleghorn, from R.F.C. Corpl. D. Burt, from 2nd King Edward's Horse; 1st Class Air-Mechanic W. J. R. Sheppard, from R.F.C.; 2nd Class Air-Mechanic F. T. Nettleingham, from R.F.C. 2nd Class Air-Mechanic J. W. Maddock, from R.F.C.; July 26th, 1916. Mech. Staff-Sergt. W. E. Phillips, from A.S.C.; July 30th, 1916.

Supplementary to Regular Corps.—Second Lieutenants to be Lieutenants:—Aug. 1st, 1916: H. W. Butterworth, F. Tedman, (Temporary Capt.), F. Hudson, C. H. Morgan, H. S. Ward, S. A. Laird and E. S. Bramham.

Second Lieutenants (on probation) confirmed in their rank: A. D. Spiers, J. P. Stephen, H. F. Blake, H. B. Neame, C. A. Cuthbert, E. Rivers-Smith, L. D. Russell, N. L. Godber, P. G. Emery, A. J. L. Chrystall.

H. B. T. Hawkins to be Second Lieutenant; July 25th, 1916.

To be Second Lieutenants (on probation): J. E. R. Avery; June 15th, 1916. July 31st, 1916: S. M. Baber, A. W. Grigsby, P. E. Jeffcock. Aug. 12th, 1916: W. Simmonds, G. A. Powell, R. S. L. Worsley, C. Sutton, A. W. R. Trusler, and P. G. Taylor.

The following appeared in a supplement to the *London Gazette* issued on August 24th:—

Flight-Commanders (from Flying Officers).—Second Lieut. (Temporary Lieut.) K. R. Binning, General List, and to be Temporary Captain whilst so employed; Aug. 8th, 1916. Aug. 9th, 1916: Major M. A. Black, 5th D. Gds.; Capt. A. W. Tedder, Dorset R. *From Flying Officers and to be Temporary Captains whilst so employed.*—Second Lieut. (Temporary Lieut.) A. J. M. Clarke, General List; Second Lieut. A. Goodfellow, Special Reserve; Second Lieut. R. J. Mounsey, Hamps. R.; Second Lieut. J. L. Chalmers, Special Reserve; Aug. 14th, 1916.

Experimental Officers (graded as Equipment Officers).—From Assistant Equipment Officers, and to be Temporary Captains whilst so employed; June 9th, 1916: Lieut. B. M. Jones, R.E. (T.F.); Lieut. R. B. Bourdillon, Special Reserve.

Flying Officers.—Temporary Second Lieut. R. H. Stocken, General List; July 20th, 1916. Temporary Second Lieut. G. W. Riley, Oxf. and Bucks L.I., and to be transferred to the General List; July 21st, 1916. July 26th, 1916: Second Lieut. A. Ashton, R.G.A., Special Reserve; Temporary Second Lieut. E. R. Wilkinson, Midd'x R., and to be transferred to the General List. July 27th, 1916: Lieut. G. J. Scott, R.F.A. (T.F.); Temporary Second Lieut. P. W. M. Orme, R. Suss. R., and to be transferred to the General List; Second Lieut. E. B. Rice, R. Dub. Fus., and to be seconded. July 28th, 1916: Temporary Lieut. D. B. Calderwood, R.A., and to be transferred to the General List; Temporary Lieut. H. Fowler, General List, from a Flying Officer (Observer); Second Lieut. J. D. G. MacRae, Sea. Highrs., and to be seconded; Second Lieut. W. L. Fenwick, Linc. R., and to be seconded; Temporary Second Lieut. J. Palethorpe, General List; Temporary Lieut. S. R. Stammers, General List, from a Flying Officer (Observer). Second Lieutenants, Special Reserve: C. E. Blayney, R. C. M. Smith, L. D. Russell. July 29th, 1916: Temporary Second Lieut. L. J. E. Genner, North'd Fus., and to be transferred to the General List; Second Lieut. R. H. Johnson, R.F.A. (T.F.). July 31st, 1916: Temporary Second Lieut. E. Churcher, Rif. Brig. Second Lieutenants, Special Reserve: E. B. Macmanus, S. W. Dunckley; Capt. J. T. Waller, Leic. R., and to be seconded; Aug. 1st, 1916. Aug. 2nd, 1916: Second Lieut. L. A. Chamier, R.F.A., Special Reserve; Second Lieut. J. W. Francis, Special Reserve. Aug. 3rd, 1916: Second Lieut. H. O. S. Pilkington, Worc. R. (T.F.); Temporary Second Lieut. L. R. Wren, York. and Lanc. R.; Temporary Lieut. J. A. Stewart, K.O. Sco. Bord., and to be transferred to the General List; Second Lieut. M. J. J. G. Mare-Montembault, N. Som. Yeo. (T.F.). Aug. 4th, 1916: Temporary Lieut. H. W. Durtnell, Welsh R., and to be transferred to the General List; Temporary Second Lieut. A. T. Hope, Suff. R., and to be transferred to the General List; Lieut. W. G. Cope, York. R., Special Reserve, and to be seconded; Temporary Second Lieut. W. A. Reeves, E. Surr. R., and to be transferred to the General List; Second Lieut. B. W. Phillipps, R.G.A. (T.F.); Second Lieut. J. P. Stephen, Special Reserve. Temporary Second Lieut. G. G. Bentley, R. War. R., and to be transferred to the General List; Aug. 5th, 1916.

Assistant Equipment Officers.—Lieut. B. M. Jones, R.E. (T.F.); May 20th, 1916. Second Lieutenants, Special Reserve: C. F. Blunt; June 1st, 1916. H. F. Blake; June 23rd, 1916. E. E. Robb; July 12th, 1916. Aug. 1st, 1916: Second Lieut. P. C. Dixon, Dorset R., Special Reserve, and to be seconded; Temporary Second Lieut. W. W. Scott-Davidson, General List; Temporary Second Lieut. A. K. Hall, General List; Temporary Second Lieut. E. J. Phelps, General List. Second Lieutenants, Special Reserve: P. G. Emery; Aug. 1st, 1916. Aug. 7th, 1916: A. D. Spiers, H. R. Gillespie, N. L. Godber, P. M. E. Impey, S. Wilkinson. Temporary Second Lieut. S. T. Smith, General List. Second Lieutenants, Special Reserve: A. J. L. Chrystall; H. B. Neame; Aug. 8th, 1916.

Staff Officer, 1st Class (graded for purposes of Pay as an A.A.G.).—Major P. R. C. Groves, Shrops. L.I., and to be Temporary Lieutenant-Colonel; July 8th, 1916.

Staff Officer, 2nd Class (graded for purposes of Pay as Brigade Major).—Capt. C. Fraser, N. Staff. R.; July 8th, 1916.

Memoranda.—To be Temporary Second Lieutenants, for duty with R.F.C.:—Aug. 2nd, 1916: Cadet I. W. Parnell, from Harrow Sch. O.T.C.; L.-Corpl. J. Macgeorge, from Sedbergh Sch. O.T.C.; Corpl. D. Townshend, from R.E. (T.F.); Act. Sergt. F. Roux, from Canadian A.S.C.; L.-Corpl. C. E. Mott, from Merchant Taylors' Sch. O.T.C.; L.-Corpl. M. M. Kaizer, from Dulwich Coll. O.T.C.; L.-Corpl. C. W. Beatty, from Winchester Coll. O.T.C.; Sergt.-Maj. E. H. M. Fetch, from New Zealand Exp. Force; Pte. P. R. Monico, from Dover Coll. O.T.C.; Pte. L. R. Neville, from Inns of Court O.T.C.; L.-Corpl. F. P. Busuttil, from Hants. R. (T.F.); Gnr. S. Ellis, from Canadian Brig., Siege Art.; Pte. H. G. W. Matthews, from Inns of Court O.T.C.; Pte. B. Roxburgh-Smith, from Inns of Court O.T.C.; Corpl. F. P. Hughes, from S. African Inf.; L.-Sergt. A. J. Arkell, from Bradfield Coll. O.T.C.; Corpl. A. C. Coley, from Lancing Coll. O.T.C.; Cadet C. H. Dixie, from Univ. of Lond. O.T.C.; L.-Corpl. F. W. Mathias, from Clifton Coll. O.T.C.; Corpl. G. M. Hopkins, from Oundle Sch. O.T.C.; Sergt. B. V. Gordon, from Eastbourne Coll. O.T.C.; 2nd Class Air-Mechanic A. H. Bates, from Hamps. Aircraft Parks (T.F.); L.-Corpl. T. H. Gladstone, from Oundle Sch. O.T.C.; Aug. 14th, 1916.

Second Class Air-Mechanic A. Pollock, from R.F.C., to be Temporary Second Lieut. for duty with the Mil. Wing of that Corps: July 31st, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: H. R. Gillespie, E. S. Cohen, H. Straker, G. A. H. Pidcock, W. A. Verner-Furlong, F. H. Jones, A. H. Meldrum, J. W. Francis, J. Y. De La C. Elliott, S. W. Dunckley, J. A. Chown, T. E. H. Bristow.

To be Second Lieutenants (on probation):—July 31st, 1916: H. J. Robinson, P. Young, A. W. O'Q. Shire, O. B. Howell, F. G. Seabrooke, S. P. Stocks, R. M. Baird, T. A. B. Rolfe, R. T. Vernon, H. S. Counsell. Aug. 12th, 1916: S. Davis, T. Vernon, H. S. Counsell. Aug. 12th, 1916: S, Davis. G. M. Watt, H. Kirby, G. W. Dowding, W. E. Jones, G. W. Armstrong, H. T. Lydford, G. E. P. Elder.

The following appeared in the *London Gazette* of August 25th:—

Flying Officers.—Temporary Second Lieut. H. G. Bowen, D. of Corn. L.I., and to be transferred to the General List;

July 7th, 1916. Second Lieut. H. R. Lumley, Special Reserve; July 14th, 1916. July 28th, 1916: Second Lieut. (on probation) W. T. Willcox, W. York. R., Special Reserve, and to be seconded. Second Lieut. W. Fraser, Special Reserve. Aug. 1st, 1916: Second Lieut. (Temporary Lieut.) M. E. Newton, Lond. R. (T.F.); Second Lieut. (on probation) V. A. Stookes, 2nd Dgs., Special Reserve, from a Flying Officer (Observer). Second Lieut. A. H. Carnt, R. E. (T.F.); Temporary Second Lieut. C. J. Marchant, Midd'x. R., and to be transferred to the General List; Second Lieut. B. H. M. Jones, Special Reserve. Aug. 4th, 1916: Second Lieut. (Temporary Lieut.) A. W. F. Glenny, A.S.C., from a Flying Officer (Observer); Second Lieut. (Temporary Lieut.) C. E. Sherwin, Hamps. Fort. Engrs. (T.F.), from a Flying Officer (Observer); Second Lieut. (Temporary Lieut.) R. S. McClintock, R.F.A. (T.F.), from a Flying Officer (Observer); Temporary Second Lieut. H. H. James, General List, from a Flying Officer (Observer); Second Lieut. P. A. Byrne, R.A., and to be seconded; Second Lieut. G. A. H. Pidcock, Special Reserve; Capt. J. Cemlyn-Jones, R. W. Fus. (T.F.); Second Lieut. J. W. Tailford, Bord. R., and to be seconded. Aug. 6th, 1916: Temporary Lieut. S. H. Bird, Oxf. and Bucks L.I., and to be transferred to the General List; Temporary Second Lieut. G. C. Dell-Clarke, N. Lan. R., and to be transferred to the General List; Temporary Second Lieut. L. H. Stowell, General List. Aug. 7th, 1916: Lieut. A. L. Macnaughton, Australian Flying Corps; Second Lieut. R. H. Soundy, Lond. R. (T.F.); Second Lieut. (on probation) I. H. H. Robinson, R.G.A. (T.F.); Second Lieut. V. H. Collins, Special Reserve; Second Lieut. S. W. Taylor, Special Reserve; Aug. 8th, 1916.

Memoranda.—To be Temporary Second Lieutenants for duty with R.F.C.: Cadet A. P. Warren, from Oxf. Univ. O.T.C.; July 8th, 1916. Acting Corpl. E. B. Low, from Haileybury Coll. O.T.C.; Aug. 26th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 26th:—

Assistant Equipment Officer.—Second Lieut. A. Meyrick, Special Reserve; July 27th, 1916.

Memorandum.—Pte. R. L. Roe, from Sedbergh Sch. O.T.C., to be Temporary Second Lieut. for duty with R.F.C.; Aug. 26th, 1916.

Supplementary to Regular Units or Corps.—Second Lieutenants (on probation) confirmed in their rank: H. R. Lumley, V. H. Collins, W. Fraser and B. H. M. Jones.

J. R. Hembrough to be Second Lieutenant (on probation); Aug. 4th, 1916.

The following appeared in a supplement to the *London Gazette* issued on August 28th:—

Supplementary to Regular Corps.—F. F. Minchin, from Capt., 7th Canadian Inf. Bn., to be Lieutenant; Aug. 29th, 1916.

Kite Balloon Schools of Instruction.

THE following appeared in the *London Gazette* of August 25th:—

Kite Balloon Schools of Instruction.

Commandants (graded as Squadron Commanders).—From Flight-Commanders:—July 31st, 1916: Capt. G. Disney, Essex R.; Capt. D. Rainsford Hannay, 53rd Sikhs, Ind. Army.

Royal Flying Corps (Territorial Force).

THE following appeared in the *London Gazette* of August 22nd:—

Hampshire Aircraft Parks.—Lieut. W. J. Stutt relinquishes his commission on appointment to the Aeronautical Dept., New South Wales Govt.; May 30th, 1916, instead of as previously notified.

The following appeared in a supplement to the *London Gazette* issued on August 23rd:—

Hampshire Aircraft Parks.—Lieut. H. Grinstead to be Temporary Captain; July 20th, 1916.

Aeronautical Inspection Department.

THE following appeared in a supplement to the *London Gazette* issued on August 24th:—

Memoranda.—To be Temporary Honorary Captains whilst employed as Inspectors A.I.D.:—Aug. 25th, 1916: G. B. Cockburn, M. Windsor and H. Myers.

To be Temporary Honorary Lieutenants whilst employed as Assistant Inspectors A.I.D.:—Aug. 25th, 1916: H. F. Philpot, A. A. Ross, A. E. Steele, A. Boor, P. W. Smith, L. Warner, T. Greening, W. E. Reason, F. W. Birch, G. S. Walpole, W. A. Thain, F. Gordon-Crosby, E. T. Willows, R. H. Bailey, H. E. Brackenborough, W. F. Collins, C. H. Adams, H. E. Fozard, W. J. Spencer, C. H. Vickers, P. Stevens, G. T. Smith-Clarke, W. S. Kellar, E. Fairbrother, A. N. Barrett, A. B. Rogers, C. H. Grace, W. Parr, P. S. Ashdown, F. H. Hodson, H. Pearse, and M. Nares.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Previously reported Missing, now reported Killed.

Lieut. Oswald H. Crowther, R.N.V.R.

Previously reported Missing, now reported Prisoner of War.

Flight-Lieut. B. G. Tooke, R.N.

Missing.

Lieut. O. H. Crowther, R.N.V.R.
Flight Commander G. B. Dacre, D.S.O., R.N. (August 26th).
Flight Lieut. B. G. Tooke, R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Second Lieut. A. S. Butler, R.F.A. and R.F.C.
Capt. B. H. Radford, R.F.C.

Previously reported Missing, now reported Killed.

Second Lieut. J. Cooke, Durham L.I. and R.F.C.
Lieut. D. W. S. Paterson, Royal Flying Corps.
Capt. V. H. N. Wadham, Hants Regt., attd. R.F.C.

Died of Wounds.

Second Lieut. J. Brown, R.F.A., attd. R.F.C.
Lieut. C. I. Jameson, Canadian Inf., attd. R.F.C.
8836 2nd Class Air-Mechanic A. Spencer, R.F.C.

Died.

3711 1st Air-Mechanic J. A. Garside, Royal Flying Corps.
6061 1st Air-Mech. G. P. Tompkins, R.F.C.

Wounded.

Second Lieut. J. E. Burt, Middlesex Regt. and R.F.C
Second Lieut. E. W. Edwards, Queen's (R.W. Surrey), attd. R.F.C.
Capt. R. E. A. W. Hughes Chamberlain, R.F.C.
Second Lieut. L. F. Hursthouse, R.F.C.
Second Lieut. G. McDiarmid, R. Scots. Fus., attd. R.F.C.
Lieut. Hon. J. H. B. Rodney, Rif. Brig., attd. R.F.C.
Second Lieut. E. T. Shand, N. Zealand M.I., attd. R.F.C.
5092 2nd Air-Mechanic L. Coldrick, R.F.C.
14573 2nd Air-Mechanic E. R. Deal, R.F.C.
11434 2nd Air-Mechanic P. England, R.F.C.
8186 2nd Air-Mechanic K. D. Handel, R.F.C.
7447 2nd Air-Mechanic J. Harling, R.F.C.
7941 2nd Air-Mechanic F. H. Shanks, R.F.C.
7747 2nd Air-Mechanic C. H. Thornicroft, R.F.C.

Missing.

Lieut. H. H. Whitehead, Can. Inf., attd. R.F.C.

Previously reported Missing, now reported Prisoners of War in German Hands.

Second Lieut. E. B. Harvey, London Regt., attd. R.F.C.
Second Lieut. W. J. M. Tomson, R.F.C.

Previously Officially reported Missing, now Unofficially reported Prisoners of War in German Hands.

Capt. A. J. Evans, R.F.C.
Lieut. H. O. Long, R.E. and R.F.C.
Capt. C. W. Snook, R.F.C.

Previously reported believed Taken Prisoner at Kut-el-Amara, now reported Prisoner of War.

1414 1st Air-Mechanic J. Hogg, R.F.C.

Flying in Egypt.

IN an interview said to have been given by General Sir A. Murray to a local journalist at Cairo, the statement is made that, although the enemy aeroplanes are still attempting to harass our troops, their aircraft and pilots are much inferior to ours.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Aug. 22nd, 1916	10,817	16	7
Collected at the Westland Aircraft Works, Yeovil (Forty-fifth contribution)	0	13	10
Staff and Workers of Gwynnes, Ltd. (Twenty-second contribution)	8	6	0
Total, August 29th, 1916 ..	10,826	16	5

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

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From the British Flying Grounds

Grahame-White School, Hendon.

Straights with instructor last week: Messrs. Culver, Meering, Saunders, Styles and Zambounis. Circuits with instructor: Messrs. Hodgkinson and Lyles. Circuits alone: Mr. Kay. Eights with instructor: Messrs. Duncan, Fisher, Jamie, Keymer, Ormerod, Shadwell, Soden and Ward.

Brevets: Messrs. Ballard, Cooper, Donald, Drew, Goodhart, Mulville, Rodocanachi and Stevens.

Instructors: Messrs. Manton, Winter, Pashley, Biard and Hale.

Beatty School, Hendon.

The following pupils were out during last week: Mrs. Wilkinson, Messrs. Gadsden, D. C. Squires, J. Squires, de Wilde, Curry, Wood, Gliksten, White, Bruce and Owen.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes and Caudron dual-control and single-seater tractor biplanes.

Mr. J. W. Towson took an exceptionally good certificate on a Beatty-Wright machine on the 22nd inst.

Six passenger flights were taken in the course of the week.

Hall School, Hendon.

Pupils at work last week: With J. Laurence Hall and Gerald Smith: Mr. Stamps. With Fred J. Glegg: Mr. Mayer, Lieut. Raymond Malden, Messrs. Stamps, Henley and Illingworth. With Cecil M. Hill: Messrs. Cordner, Orton, Gudger, Lieut. Malden and Mr. Rayne. With Stanley G. Cownie: Messrs. Bateman, Yuill and Course.

Hall Government-type tractors in use.

Royal Aero Club certificate taken by Mr. Gudger.

Extra practice taken during the week by Mr. Rayne on Hall 70 h.p. tractor biplane.

London and Provincial School, Hendon.

Pupils doing straights last week: Messrs. Quayle, Egerton, Lewis, Dunnett, Sellars and Davy. Circuits and eights: Messrs. Mander, Rogers, Fox and Randell.

Royal Aero Club certificates taken by Messrs. G. H. Rogers, T. C. Mander, H. S. Fox and C. L. Randell.

Instructors: Messrs. W. T. Warren, M. G. Smiles, W. T. Warren, Jun., and P. G. Allen.

Four tractor biplanes in use.

Ruffy-Baumann School, Hendon.

Pupils with instructors last week: Messrs. Fanshawe (34 mins.), Carr (34), Trubridge (34), Holmes (solo), Hayes (38 mins.), Paton (15), Good and Babington Smith (20). Doing figures of eight or circuits alone: Messrs. Fanshawe and Holmes.

Instructors: Ed. Baumann, Félix Ruffy, Ami Baumann and André Thomsen.

50 and 60 h.p. Ruffy-Baumann tractor biplanes in use.

Several pupils waiting for calm weather to take their certificates.

Bournemouth School.

Pupils rolling alone last week: Messrs. Davies, Constant, Holland, Wilmott, Montgomery and Wingfield. Doing straights alone: Messrs. Brandon, Hammersley, Pritt, J. B. Smith, Hinchliff and Adamson. Half circuits alone: Messrs. Pritt and Hammersley. Figures of eights and circuits alone: Messrs. Smith and Daniel.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

35, 45 and 60 h.p. Caudron tractor biplanes in use.

Certificates taken by Messrs. J. Wilson and O. Wilson.

The usual exhibition flights were carried out very successfully by Mr. S. Summerfield, who was again very busy with passenger flights.

FLYING AT HENDON.

Only a few flights were made at Hendon last Saturday, as there were a good many rather wet patches, well mixed with thunder, in the air. It was also somewhat draughty up above. However, what flying did take place was well worth seeing; although it was not until late in the afternoon that the first machine went up. This was the new L. and P. tractor biplane, piloted by Willie Warren, and, of course, containing A. A. Fletcher. Climbing to an altitude of about 2,000 ft., they flew over towards Finchley, to where a party of wounded soldiers were being entertained at an open-air fête. Here some very fine loops were executed for the benefit of the brave lads. The approach of a thunderstorm necessitated a hasty termination to these demonstrations, and they only got back to the aerodrome just in time. Warren, as well as M. G. Smiles, made further flights on this machine during the rest of the afternoon. Several of the new G.P.'s (Government Pupils) were taken up for their first airing. Some very fine flights were also put up by Sydney Pickles on a Hewlett and Blondeau B.E. On one occasion, when accompanied by a lady passenger, he reached an altitude of 9,000 ft. Just before school work started, L. L. King took up a Beatty-Wright, fitted with one of the latest monobloc Beatty engines, and did a little banking.

Throughout the greater part of Sunday afternoon it rained heavily, but in the evening it brightened up a bit and most of the schools came out and got in a bit of practice. H. Sykes gave some exhibition flights on the Martinsyde, but otherwise there was nothing else doing.

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The F.N.B. Series.

In connection with the group of portraits of pupils who have recently qualified for Royal Aero Club certificates at the Ruffy-Baumann School, Hendon, which appeared in our last issue, it should be noted that these are included in the F.N.B. Series of pilots' portraits. This, it is almost unnecessary to add, is a speciality of Mr. F. N. Birkett, who at his studios at 97, Percy Road, Shepherd's Bush, W., has a complete aviation outfit for the use of his clients who wish to have their photographs taken in "flying rig."

SUPER-ZEPPELINS.

COMING as it does from one who is in close touch with aeronautics, the following article by Baron Ladislas d'Orcy in *Scientific American* will be read with interest by our readers. Although, in the main, Baron d'Orcy's views appear to be correct, the author fails to point out one thing which is very significant, *i.e.*, that not only has the stern of the latest airships been given a more pointed form and the fineness ratio reduced, but, judging from photographs of the wrecked airship there can be little doubt that the envelope does not have the parallel sides that characterised the earlier Zeppelins, but have a gradual curve all the way from stem to stern, much after the fashion of the ill-fated Schütte-Lanz airships.

In his table of wrecked airships the author does not mention the "L 4," which was wrecked on the west coast of Denmark at practically the same time as the "L 3." This may be explained by the fact that the "L 4" was a Schütte-Lanz, but it should, we think, be included, as it was a ship of the rigid type, and capital size. To bring the table up to date the wrecks of "LZ 85" at Salonica and "L 7" on the coast of Slesvig should be mentioned, giving a total of 30 airships, of which the loss of 24 has been authenticated.

"It is common knowledge that for some time past a new type of Zeppelin, far more powerful than any of its predecessors has been commissioned with the Air Service of the German Navy. The recent destruction, by the agency of the Allies' anti-aircraft artillery, of two of these vessels has now afforded the long-sought opportunity for getting a closer view of this type of aircraft, which, for the sake of convenience, we shall term a super-Zeppelin.

"A layman might hardly discern any change in the outward appearance of a super-Zeppelin when compared with previous types; it appears, however, upon examination of what remained of the vessels destroyed at Révigny (the 'LZ 77') and in the mouth of the Thames (the 'L 15'), that the hull, steering organs and propelling apparatus have been redesigned to a great extent on the latest types.

"It is a matter of discussion whether there exists but one new type or whether the Zeppelin works still turn out a large, long-range type for naval raids and one, smaller but faster, for military reconnaissances. The fact remains, however, that the Germans possess at present a large type of Zeppelin whose features, as far as they are known, shall be discussed herewith.

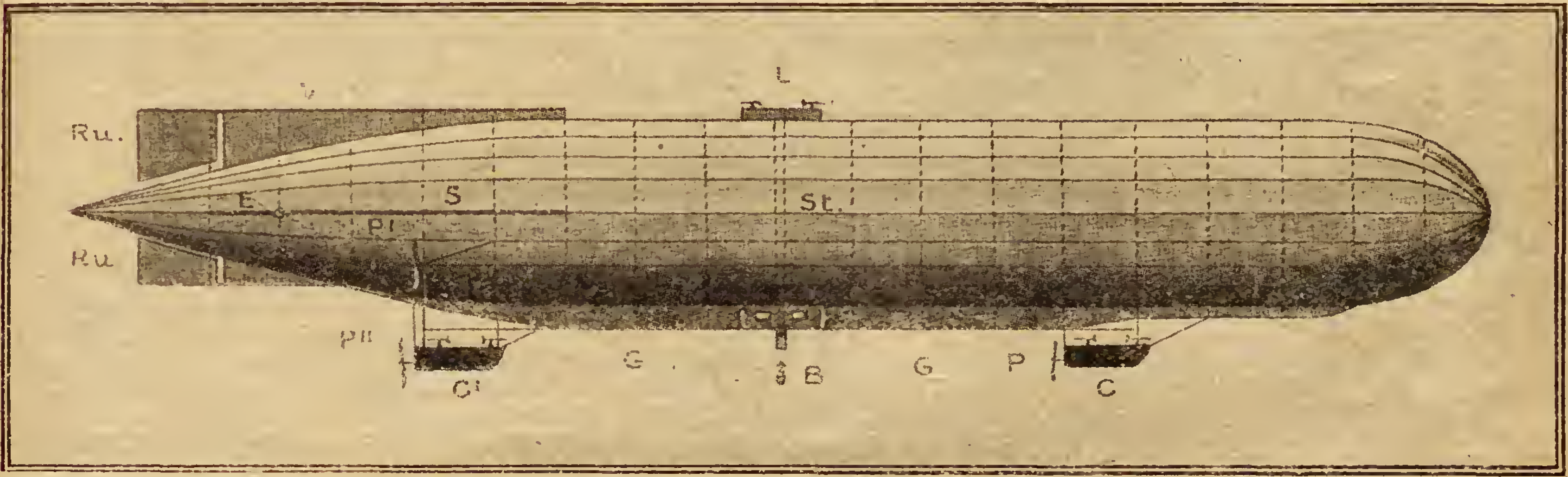
"THE HULL.—The hull of the *ante-bellum* Zeppelins was in the shape of a cylinder with two symmetric ogival ends—a very poor form, aerodynamically speaking; and it was still made worse by an exaggerated aspect ratio of ten to one, which comes to say that the hull was ten diameters long.

"On the super-Zeppelin this defect has been remedied to some extent. The bow is slightly blunter than before, while the stern is nearly conical; furthermore, the aspect ratio has been somewhat decreased, so that now the hull is only about eight or nine diameters long. Although this ratio is still some way off the one disclosed by aerodynamic research work to effect the smoothest airflow (6 : 1), it must materially assist the super-Zeppelin in attaining a greater speed without the expenditure of additional power.

"Regarding the size of super-Zeppelins, an examination of the wreck of the 'LZ 77' reveals that this vessel (which undoubtedly belonged to a recent type, as is disclosed by her factory number) was about 540 ft. long, with a displacement of over 1,100,000 cubic ft., which would furnish a lift of about 33 tons.

"THE STEERING ORGANS.—The steering organs have been greatly simplified on the super-Zeppelin.

"A picture of the 'L 15' (which was photographed before she broke up and sank) shows clearly that in place of a large number of small and parallel rudders and elevators, there is now a compact *empennage*, very similar to that of a tractor aeroplane. Both rudder and elevator now consist of simple 'flaps,' which are hinged to the vertical and horizontal fins respectively.



Diagrammatic View of a 30-ton Zeppelin. Drawn from data obtained from the wrecks of "LZ 77" and "L 15." $(C\,C^1)$ engine cars (the one in front containing the pilot house; $(P\,P^1\,P^{11})$ propellers; (G) gangway connecting the cars and containing water ballast and fuel tanks; (St.) stairway leading from bomb-room (B) to armed lookout (L); (S) stabilising fin; (E) elevator; (V) vertical fin; (Ru.) rudders.—(*By courtesy of "Scientific American."*)

"Their surface area has naturally increased, as the conical stern takes up less space than when it was blunt; as a consequence, and owing also to a smoother air-flow, the efficiency of the steering organs should have materially increased.

THE PROPELLING APPARATUS.—The distribution of power has been very radically redesigned on the super-Zeppelin, the new system being one that follows marine practice closer than was customary hitherto.

"While the 1914–15 type of naval Zeppelin was propelled by two sets of two 200 h.p. engines, each set driving two airscrews mounted on outriggers on either side of the hull, the super-Zeppelin carries but one engine in the front car and three engines in the rear car. Two of the stern engines drive side propellers in the old fashion; but the third one, as well as the front engine, each drive a directly coupled propeller at the rear of the cars.

"The advantages derived from mounting the propellers astern are manifold: Firstly, as there is nothing to interfere with the air thrown back by the propellers, the efficiency of the latter should be somewhat increased; secondly, the danger of sparks from the exhaust, which might ignite the hydrogen, is rendered very remote; and thirdly, the mounting of the engines in the stern car should afford more room in the front car for the navigating *personnel*.

"One might therefore assume that ultimately the stern car will become the sole engine room, while the bow car will be the navigating room and nothing else. If this has not yet been done it should rather be attributed to a lack of higher-powered engines than to some obscure reason for keeping one propeller ahead.

"Armament.—The armament of these vessels has hardly changed. The bomb-room has remained in the middle of the gangway, but the crude way of dropping bombs by hand has been superseded by a scientific appliance, whereby the bombs are released electrically.

"In addition to the two machine guns mounted on each car, two more have been provided for arming the lookout post atop of the hull, which is connected with the bomb-room by means of a stairway encased in a chimney.

"Thus far the apparent changes affecting super-Zeppelins.

"Modifications relative to the ratio of dead weight to useful load are more or less a matter of speculation. On the *ante-bellum* Zeppelins the useful load amounted to about one-fourth of the total lift. According to a statement emanating from Count Zeppelin's secretary, the climbing power of the new type is two-fifths better than on previous types, and the load of ammunition amounts to two tons; it might therefore be assumed that the useful load is also at least two-fifths better than heretofore, in which case its ratio would be 35 per cent. of the total lift.

"Such an improvement is entirely within the present-day possibilities, if one bears in mind that the ratio of dead weight to useful load *decreases* with the Zeppelin's size and that the super-Zeppelins displace about ten tons more than the vessels of the previous type. Some weight may also have been saved through an improved system of construction, as well as by the new 200 h.p. engines, which weigh only 880 lbs. instead of 985 lbs.

"On the basis of the above ratio a 33-ton super-Zeppelin carries a useful load of about 11½ tons—more than double the load the previous type was capable of lifting. If such is the case, allowance for two tons of ammunition leaves 9½ tons available for crew, ballast and fuel.

"The Crew.—Of the two super-Zeppelins destroyed lately, the 'LZ 77' carried 15 men, and the 'L 15,' whose crew was captured, 2 officers and 16 men. Supposing the latter figure represents the war complement of the largest super-Zeppelin, it remains to be computed how these 18 men are detailed for navigating and fighting.

"The three-engined passenger Zeppelins required a navigating *personnel* of 9 men, distributed as follows:—The commander, 2 helmsmen and 2 mechanics in the front car (housing 1 engine); and a chief engineer and 3 mechanics in the rear car (housing 2 engines).

"Although a super-Zeppelin mounts a third engine astern, it might be assumed that the engine crew has not been increased, 5 mechanics and 1 engineer being quite sufficient for looking after 4 engines. But in view of the super-Zeppelin's long cruising radius a third helmsman might have been added to the crew; this would leave 8 men, including the lieutenant, for manning the bomb tube and the machine guns. Six men are required for manning the latter; the remaining two would then constitute the bomb-crew with the lieutenant as gunnery officer, and possibly, second in charge of navigation.

"A complement of 18 officers and men represents a load of about one and one-half tons; there would then remain 8 tons for ballast and fuel.

"The Ballast.—There are very good reasons for believing that the water-ballast has been considerably increased on the 33-ton airships. Vessels of the previous (23-ton) type, which carried 1½ tons of ballast, used to navigate at an altitude of 5,000 ft., and hardly ever reached the 9,000 ft. mark, excepting during trials; super-Zeppelins, however, often reach an altitude of 10,000 ft., and are currently seen navigating at 7,000 ft.

"Whereas the buoyancy of a Zeppelin is just sufficient to keep the vessel floating at a low level, great heights can be reached only through a combination of dynamic lift (expenditure of engine power) and of static lift, the latter being attained both through jettisoning ballast and burning fuel, and in extreme cases, by a forced dropping of bombs.

"The question of ballast is one closely allied with that of compensating losses of buoyancy at great heights. Lack of space unfortunately forbids a detailed discussion of this subject; suffice it to say, that losses of buoyancy cannot be made up entirely by jettisoning ballast and one might assume that some artifice, possibly a system of compensating ballonets for each of the 20 or more gasbags, has been devised for remedying this defect on super-Zeppelins.

"Such a course should not be astonishing at all in view of the several airships the Germany Navy lost in the North Sea, for the sole reason that when they came down from a great height, the gas, after having expanded, contracted through the greater atmospheric pressure and proved insufficient for insuring the necessary buoyancy. It was this phenomenon which caused the loss of 'L 3' and 'L 4,' not to speak of others.

"Anyhow, one can safely assume that the ballast of a 33-ton vessel is at least double that of the *ante-bellum* Zeppelin, say three tons, but more probably four tons, leaving four tons available for the fuel.

"Cruising Radius.—As the fuel consumption of the four-engine unit amounts to about 450 lbs. per hour, four tons of

Table showing Probable Zeppelin Losses from August 1st, 1914, to May 3rd, 1916.

No.	Name.	Place.	Date.	Cause of Loss.
1	Z 8	Badonvillers, France ...	22.8.1914	Destroyed by French gunners. Part of crew lost.
2	Z 5	Mlava, Russia	29.8.1914	Destroyed by Russian gunners. Crew lost.
3	?	Seradz, Russia	6.9.1914	Captured, while at anchor, by a cavalry patrol. Crew of 30, prisoners.
4	?*	Düsseldorf, Germany ...	9.10.1914	Destroyed in shed by British aviators.
5	LZ 31	Friedrichshafen, Germany ...	21.11.1914	Destroyed in shed by British aviators.
6	?*	North Sea	23.1.1915	Foundered during a storm.
7	L 3	Ebsjerg, Denmark	17.2.1915	Stranded, having run out of fuel, and broke up. Crew of 16 interned.
8	L 9	Boulogne, France	5.3.1915	Foundered during a storm, after having raided Calais. Crew lost.
9	L 8	Tirlemont, Belgium... ...	4.3.1915	Damaged by British aviator; wrecked on landing. 21 of crew killed.
10	?*	Thielt, Belgium	12.4.1915	Damaged, over Béthune, by French gunners; wrecked on landing.
11	?	North Sea	26.5.1915	Broke away without crew; foundered off Heligoland.
12	LZ 37	Evere, Belgium	7.6.1915	Destroyed in shed by British aviators.
13	LZ 38	Ghent, Belgium	7.6.1915	Destroyed in mid-air by British aviator. Crew lost.
14	L ?	Ostend, Belgium	10.8.1915	Raided London. Destroyed, upon her return, by British aviators.
15	?	Vilna, Russia	24.8.1915	Shot down by Russian gunners. Crew of 10 made prisoners.
16	?	Saint-Hubert, Belgium ...	13.10.1915	Destroyed by exploding in mid-air.
17	?*	Maubeuge, France	16.10.1915	Stranded on a chimney and broke up.
18	?*	Grodno, Russia	5.11.1915	Destroyed by the storm on landing.
19	L 18	Tondern, Germany	17.11.1915	Wrecked in shed through an accidental (?) explosion.
20	Z 28	Hamburg, Germany ...	17.11.1915	Wrecked by the storm.
21	L 22	Tondern, Germany	1.12.1915	Destroyed in shed through accidental explosion of a bomb.
22	?	Kalkun, Russia	5.12.1915	Shot down by Russian gunners. Crew lost.
23	?	Mainvault, Belgium ...	30.1.1916	Raided Paris. Damaged by French aviator; wrecked on landing.
24	L 19	North Sea	21.2.1916	Raided England. Probably run out of fuel; foundered. Crew lost.
25	LZ 77	Révigny, France	21.2.1916	Shot down by French motor guns; destroyed in fall. Crew of 15 killed.
26	L 15	Kentish Knock, England ...	1.4.1916	Shot down by British gunners. Crew of 18 surrendered. Vessel sank.
27	L 20	Stavanger, Norway	3.5.1916	Raided Scotland. Stranded, having run out of fuel and drifted with the wind. Blown up by crew: 3 killed, 16 interned.

* Destruction not authenticated.

fuel would keep the engines running for about 18 hours at full speed (55 knots), and thus insure a cruising radius of 990 nautical miles. The latter figure will possibly necessitate a reduction of, say, 10 per cent., if allowance be made for the fuel burnt while climbing.

"If it were feasible to run the vessel on the homeward journey (after she has been lightened up through the expenditure of fuel, ballast and bombs), with two engines only, the radius of action might be somewhat increased. By using the formula

$$\text{Speed at } x \text{ Power} = \frac{\text{Full speed}}{\sqrt{\frac{\text{Full power}}{x \text{ speed}}}}$$

one finds that by running with two engines the airship would develop a speed of 38·8 knots, which means a saving of 225 lbs. of fuel per hour, and consequently an additional cruising radius of about 200 nautical miles (9 hours at 55 knots =495 nautical miles + 18 hours at 38·8 knots = 698 nautical miles, total: 1,193 nautical miles)."

"X" AIRCRAFT RAIDS.

"X 44" Raid, August 23rd.

The following communications from the Field-Marshal Commanding-in-Chief, Home Forces, were issued through the Press Bureau:—

August 24th, 10.35 *a.m.*

"One hostile airship crossed the East Coast shortly before midnight. A number of incendiary and some high-explosive bombs were dropped in open fields. No damage and no casualties have been reported. The airship went to sea again before 1 a.m."

4.20 *p.m.*

"There is nothing to add to this morning's *communiqué*.

"Fifteen high-explosive and 15 incendiary bombs were dropped by the raiding airship, all of which fell in open fields. There were no casualties, and no damage was caused."

German Version.

Berlin, August 25th.

"One of our airships on the night of the 23rd attacked the fortress of London."

"X 45" Raid, August 24th–25th. *August 25th*, 1 *a.m.*

"Several airships crossed the East and South-East Coast shortly before midnight. A number of bombs were dropped, but so far no report of casualties or damage has been received."

10.30 *a.m.*

"Six hostile airships raided the East and South-East Coasts of England last night at intervals between midnight and three a.m. One airship made her way westwards well inland; the remainder carried out short inroads over the coast. The number of bombs dropped by the raiders is as yet uncertain. Several are reported as having been directed against ships at sea. The damage effected by the raid is slight. In one locality a railway station and several houses were damaged and two horses killed; at another two houses were wrecked. The total casualties have not yet been reported. Up to date nine persons have been reported injured, some fatally. Anti-aircraft guns came into action at certain points both on land and from ships at sea. Some of our aircraft went up in pursuit. One aeroplane succeeded in firing into a raider at close range, but she eluded her pursuers in the clouds.

"A further report will follow."

4.50 *p.m.*

"Further reports show that five or six enemy airships raided the East and South-East Coasts of England as already stated. Two or three of the raiders came in over the Eastern Counties, and dropped over 30 bombs without causing any casualties or damage. Another raider attempted to approach a seaport town, but, being heavily fired on by anti-aircraft guns, was driven off to the eastward after dropping 19 bombs in the sea without reaching her objective. Another airship which visited the South-East Coast also came under heavy fire from the anti-aircraft defences, and was compelled to unload her cargo of bombs in the sea without doing any damage to life or property.

"Another raider succeeded in reaching the outskirts of London, when explosive and incendiary bombs were dropped, and it is regretted that casualties occurred among the civilian population as follows:—

	Men.	Women.	Children.
Killed	3	3	2
Injured seriously	3	4	0
Injured slightly	4	7	3

"In addition, one soldier was seriously and 14 slightly injured by broken glass.

"As far as it has been ascertained at present, some 40 bombs were dropped. Most of these fell either on small property or in the open, but an electric power station was slightly damaged, and engineering works were somewhat damaged by fire. Several small fires occurred, all of which were promptly extinguished by the London Fire Brigade, several persons being rescued from positions of danger by firemen. Fire was opened on this airship, which immediately altered its course. It is possible that the first airship was followed by a second raider, but this cannot for the present be verified. Some of our airmen went up in pursuit, and, as stated in this morning's *communiqué*, one airman succeeded in firing at a raider at close range. In all 100 bombs are known to have been dropped by the raiders."

German Version.

Berlin, August 25th.

"During the night of August 24th–25th several naval dirigibles attacked the southern portion of the East Coast of England. They dropped numerous bombs on the City and the south-eastern district of London, and the batteries at the naval stations at Harwich and Folkestone, and numerous vessels moored in Dover Harbour. Everywhere very good results were observed. All the airships have returned, although they were heavily but unsuccessfully shelled by numerous defence works, and during their attacks were fired at by anti-aircraft batteries."

CORRESPONDENCE.

The Total Suppression of Flying.

[1927] As I am sure that "FLIGHT" has no wish to misrepresent my proposal for the suppression of flying, will you allow me to point out that my suggestion had nothing to do with the abolition of war, but only desired the elimination from it of elements that might be a peril to society. If science puts sufficiently awful capacities for destruction into our hands, it is plain that nations will have to agree to forbear from using them in their quarrels. There is proof of that in the protest of the United States against the unannounced drowning of non-combatants, even though only the convenience and not the existence of society is affected thereby. If we, or any of our Allies, knew how, and used our knowledge to spread bubonic plague, or any other pestilence, through the Central Powers, I take it that the protest of the States would be still more emphatic, and might even lead to some form of action. We do thus admit the principle that certain modes of killing must be barred to combatants, and that the intervention even of a feeble military power, like the States, can enforce restrictions of which the bulk of humanity approves.

There is thus nothing in my proposal which is new to international practice, or to the exercise of international powers. The nations agreed to ban explosive bullets, which can be manufactured in absolute secrecy by thousands of millions; why then should they think it impossible to ban flying, which must publish its least existence over miles of country, and which, unlike the bullet, is a menace at any moment, not only to every home, but to the conditions which, laboriously, during thousands of years, we have built up for the betterment of mankind.

H. F. PREVOST BATTERSBY.

St. George's Hill, August 24th.

Armchair Reflections

by the "Dreamer"

THERE are, and I suppose always will be, people who must be for ever meddling with things. Sometimes to advantage, generally otherwise, the names of common objects get altered by some genius, and pushed with such persistence as to become accepted, in place of the original.

Americanisms we are inclined to look upon as funny, generally. We admit them as being sometimes cute and expressive, but we never seriously fear they will find their way into our dictionary, although one, an absolutely coined name, and apparently meaning nothing in particular at its birth, has done so. It is the word " odak." Kodak was given in earlier editions of Webster as meaning a snapshot camera, but it was stated that it was an invented word. In recent editions Kodak has the honour of having grown to two paragraphs, the second one reading: "Kodak. To photograph with a kodak: hence to describe or characterise briefly and vividly." It is possible that in time we may hear a judge admonish a witness, inclined to long windedness, to "kodak."

Somebody has again started an objection to speaking of "aeroplanes." I have looked at the word from all points of view, and really cannot find anything wrong with it. Aeroplane seems to me to be a good fit. Hydroplane, I admit, is not a good word, for it clashes in ideas with another machine, but waterplane or seaplane seem all right.

I suppose the contention is that a seaplane is also an aeroplane, although I suppose an aeroplane need not necessarily be a seaplane. Yet aeroplane and seaplane, or if we MUST be exact, seaplane and landplane—the latter is clumsy—would fill the bill. Anyway, the names I have seen suggested in place seem to me to be weak in the extreme.

One correspondent in the *Pall Mall Gazette* suggests that they should be called "flys," and he is backed in his opinion by others, and it should be remembered that in a way it has pioneer justification, as the Wright Brothers pinned their faith to "flyers." One says: "It sounds a bit funny at first, but when one thinks a bit about it one sees how sensible it is." Well, may be, but why think about it? Would seafly and landfly be the result? I can suppose entomological names also for the various sizes of machines. A report from the Front that a "bluebottle escorted by gnats gave battle to a swarm of seaflys" would read like Zig-Zags from the Zoo.

From quite an outside source comes, as noted last week, the horror of "Birds" as an alternative; landbirds and seabirds. In this direction there ought to be nothing doing. Nicknames always run riot in the services, and I shiver to think of some of the appellations that would be dug up by our light-hearted boys if either "birds" or "flys" gained the day. We have already had the June Bug and the Infuriated Grasshopper, but——let's stick to aeroplane for overland craft, or, better still, plane—as so often used in these pages—if aeroplane is too much of a mouthfull. The "sea" is easily added to define overwater machines.

* * *

I sometimes have spasms and break out into verse, but the following is not mine:—

Hail to thee, high flyer,
Who with generous heart
Pourest out thy fire
Over earth's dim chart,
In sundry spasms of well premeditated art!

Now this is an ode to the thing the searchlights seek at night. There is the high flyer, the generous heart, pouring out fire, premeditated art. The last line drags a bit, but no matter. Also, I would suggest a better, though similar sounding name for the initial word. Here is the second verse:—

Like a monstrous bird
Overseas thou comest;
Melodies unheard
Through the heavens thou hummest,
And bombing still dost soar, and soaring ever bombest.

Somehow or other that last word does not seem to rhyme, but it is probably one of the spasms of well premeditated art. Shades of Shelley that his beautiful "Ode to a skylark" should have been strafed so remorselessly.

As a set-off, here are some by a boy reader who says he is 11 years of age. He says it is "Poetry," and I will take his word for it. In any case it is original and shows some promise:—

Up and out to reconnoitre.
Up above the clouds to loiter.
Out to make a reconnaissance.
Out to make them make obeisance
To the British R.F.C.

You should see the Vickers' Fighter
Empty on a German "blighter."
You should see the deadly Fokker
Sent to Davey Jones' locker
By the British R.F.C.

You should see the Bristol scouting.
You should see the Avro routing,
Then, afterwards, the German doubting
If he's got an R.F.C.

Once I had to find a rhyme for "torpedoed," and I did not come out of it so well as my little friend with "reconnaissance" and "obeisance," to say nothing of "fighter" and "blighter," which speaks of poetic pluck beyond my reach. As a fact, at his age, I am not sure that I dared tackle "reconnaissance" at all, but should have sought relief in something like this:—

Out to take a look around.
(Words to fill up) on the ground.

Now there's genius for you. Come fill up your bumpers, for I am in a right merry mood, and—

Sing hey, sing ho, sing hey for the poet free;
A blithesome chap who cares no rap,
No earthborn son is he.
Sing ho, sing hey, sing ho neath the spreading tree;
This "Dreamer" chap who cares no rap,
No earthly thing can be.

AVIATION IN PARLIAMENT.

SPEAKING on the motion for the adjournment in the House of Commons on August 22nd, Mr. Pemberton-Billing said: Before this House adjourns I should like to take the opportunity of calling the attention of the Government to one or two points, which I think I have done before, and possibly done in vain. I really consider that the present defences of this country, as we know them to be, demand that attention should be called to them on the Adjournment. I would like to show the Government that the public are not satisfied. I know that the Government are so overworked that they have not time really to think of what the public do feel about this matter. There is no question of panic at all. It is purely a question of this, that for two years and some months the Germans have been threatening and carrying out raids over this country, and yet the defence against Zeppelins to-day, although it has been amplified, is not more scientific than it was two years ago. Have we learned anything about it? It is all very well for Ministers in official communications to say that these things are of no military significance. That is not true. There is military significance in everything in war, and if there is any significance at all there certainly has been in these raids. As I pointed out in the House, the other night, if one carried out similar raids in Germany by way of reprisal, if we raided one of their towns, we should very soon find what German men and women, the non-combatants, would have to say. I am satisfied that if we had the men and the material to do that, German opinion, seeing the price they had to pay for their raids over England, would very soon say, "Stay your hands." They do not want these raids over their towns, and I am perfectly satisfied that they in their turn would not be prepared to undergo the suffering they have caused here.

Continuing Mr. Billing said he had several letters from all parts which contained statements at variance with the official statement. He continued: Since I spoke last the Air Committee of Inquiry into the administration and command of the Air Service has brought forth a Report. I have heard of mountains being in labour producing a mouse. It is not my intention to answer that Report in detail, but I am going, for the benefit of the House, to take just one case to prove how generously this Committee anticipated the wishes of the Government, and to prove that I was justified in that case, and if there is any other case that I have ever mentioned on the floor of this House or on the public platform which either the representatives of that Committee in this House or any member of the Government care to challenge me on the floor of the House I am prepared to substantiate it. My difficulty in that case, as it must be in all cases, is to make my point, which is a Service point, without not only involving but damning the career of the officers who are interested in this particular case. What did the Committee of Inquiry say about the one case which I will just put to the House? In their Report they state:

"Statement by Mr. Pemberton Billing—Desmond was killed on some type of B.E. machine which had been repaired by the Royal Aircraft Factory. The repaired part broke at 4,000 ft. up, and the pilot was pitched out.

"Mr. Pemberton Billing's suggestion is that it was 'faulty design or in bad repair.'"

I frequently attacked the Government as to spare parts, and I have also attacked official repairs. These are the facts as given by the Committee, founded presumably on statements of the military witnesses.

"The date was May 28th, 1913. The place, Montrose. There was a suggestion made at the time that there had been a patch on the outside of the right wing of the plane, and that someone had broken the tip of the wing, then repaired it, and put a patch over the repaired part, the suggestion being that this was done by someone with a view to hiding some damage which he had done to the machine. The matter was closely inquired into at the time by a Committee, of which Mr. H. T. Baker, M.P., was chairman. The Committee have had

New York Naval Militia Aviation Camp at Bay Shore, N.Y., as seen from one of the service flying boats. (*Aviation.*)

the notes of the whole of the evidence given to that Committee before them."

I would like just to mark that point.

"There were twenty-three witnesses. The suggestion depends on the unsupported evidence of one man out of those twenty-three witnesses. No useful purpose would be served by reopening the matter, especially as some of the witnesses called have since been killed."

Now listen to what the Committee say :—

"A perusal of the transcript of the notes of the evidence lead to the conclusion that the suggestion of a patch is quite unfounded."

In fact, this Committee say that Mr. Pemberton Billing made a statement for which he had no justification. He said there was a patch, and there was no patch ; he said there were repairs, and there were no repairs ; he said the pilot lost his life through maladministration, and that the man was killed through the machine crumpling up in the air through bad design or bad repair, for which officials were responsible ; and it is a lie, and the charge he has brought is without foundation. Let us look at the actual Report of the Committee on Public Safety and Accidents, which investigated the case, and the notes of which the Air Committee had before them. The Public Safety and Accidents Committee sat on June 2nd, 1913. There were present Major Sykes, Major Burke, and the Royal Flying Corps military representatives :—

"On consideration of the evidence the Committee regard the following facts as clearly established (1) that the aircraft was built at the Royal Aircraft Factory in June, 1912, and rebuilt there with new wings in August, 1912.

"The examination of the wrecked aircraft clearly indicated that the top right-hand wing tip had been broken at some time or another and repaired in three places.

"The joint between new and old piece of the main spar had been made in a most improper and unsafe manner.

"The toper splice in the woodwork, about 7½ inches long, was very roughly made and badly fitted, there being places in which the glue was an eighth of an inch thick. The splice was subsequently bound with whip-cord, which was not treated with cobbler's wax or varnished to prevent it becoming loose. The new portion of the spar was not varnished, but left in its natural state.

"After the repair had been made, new fabric was put over that portion of the wing affected by the breakage. The new fabric was of a different material from the rest of the wing. The representatives of the Royal Flying Corps and of the Royal Aircraft Factory reported that their records contained no entry of this repair having been made to the wing of this aircraft since it was rebuilt.

"Pieces of the wing and struts were picked up a mile away from the spot where the aircraft struck the ground and in the direction from which the aircraft was seen to come, and in such positions that they must have fallen from the aircraft whilst still in the air.

"The Committee is of opinion that the primary cause of the accident is the failure of the faulty joint in the repair to the rear main spar. This joint, subjected as it necessarily was to vibration when flying, and probably at the last only held together by the wrapping of cord, the glue having failed previously, eventually gave way.

"The Committee is further of opinion that the repair referred to above was so badly done that it could not possibly be regarded as the work of a conscientious and competent workman."

Sir W. Bull : What is the date of that Report ?

Mr. Billing : The 17th June, 1913. What are we to say to a Committee which makes such a finding when it has access to a Report of this description, a Report made not by a packed Committee, but by independent authorities within twenty-four hours of the accident, with the machine at their feet to examine, who say that there was a patch, a big patch, that the wing had been broken in three places and clumsily repaired, not repaired in a conscientious manner, and that the man when told to fly a certain machine had confidence in his senior officer that it was a safe machine to fly. He gets into this groggy machine to which I have referred and is dashed to death from 4,000 feet, and then it is considered improper if I say that some of our men have been murdered rather than killed. All I have to say is that if this is a sample of the reports that we are to expect from the Air Committee of Inquiry, I do not look forward with any satisfaction, and I am sure the country does not look forward with any confidence to its future findings. The great charge I brought against the Air Service was what ? Faulty mechanism. I said that there was ignorance displayed on the part of those in supreme command. There has been colossal ignorance displayed, and there is appalling ignorance being displayed now by the supreme command. So appalling is that ignorance, so forcibly has it been brought to my notice, that unless before October 10th some very drastic reforms take place, I shall have very much more to say in this House about the Air Service of our country than ever I said before.

With regard to this engine which was designed by the Government officials—this engine which has been supplied to practically all our pilots ever since the outbreak of war, in the military branch in particular. This engine has killed more men than any other mechanical contrivance in this war. We are told that this is an excellent and efficient engine. We are told that there is no justification for saying that it is mechanically impossible ; that it is a very expensive engine to produce ; that it is a very inefficient engine to produce ! I asked a question in the House the other day, as to whether the Prime Minister would give the Air Committee access to a Report, extracts of which I propose to give to the House. I was told that there was no such Report ; that it could not be found. Some gentlemen do not want to see these Reports. But there is still the pen of an honest man. Fortunately, there are one or two men—quite a number, I hope, though, perhaps, a minority—in the Departments yet who do consider that their country is something even greater than their Departments, and who do consider that if men are to be driven into the air with inefficient machinery that the least they can do is to say so. Here is the Report, from which I shall read brief extracts in the hope of guiding the hon. Member for Rugby (Major Baird) in his search for the original. Any other assistance I can give him I will be happy to do. Here is the Report. Since I raised the question in this House I have ascertained, for I did not know it, that this Report was made at the desire of the Ministry of Munitions, by one of the leading precision engineers in this country.

Major Baird (*representing the Air Board*) : Would the hon. Member say how he got that Report ?

Mr. Billing : I have not the slightest intention of involving anybody but myself. This is a Report on the labour problem for the Ministry of Munitions. He says :—

"Immediately the manufacturing of any of the component pieces or the erecting and assembling of the complete unit known as the Royal Aircraft Factory engine is attempted . . . nothing but trouble, disappointment, and scrap result."

There is another point that is rather interesting :—

"That no particular unit piece excepting a few standard bolts in the whole of the R.A.F. engine could be looked upon as a manufacturing proposition. The general design of the whole of this engine was so bad and so ill-considered from the standpoint of manufacture that the most appalling difficulties were experienced in producing it at all. After it was produced the number of consumable spares required to keep the engine running were of such enormous quantities as to make the construction of such a device a farce."

This is from the Report upon which these gentlemen are basing their replies and attacks upon me. They can have this Report if they want it :—

"Considering these statements and examining Mr. Hannay closely as to the veracity of his accusations, he invited me carefully to go through the construction of this engine with him, and the facts and figures submitted to me were so astounding as to be almost unbelievable."

I do not want to trouble the House too long. [Hon. Members : "Go on ! Go on !"]

"Prior to my inspection of the actual constructional work, Mr. Austin——"

I do not see why I should not give names.

"Mr. Austin volunteered the statement that he would be only too pleased if he had no more of these engines to construct, as they were an impossible proposition to make and an impossible machine to maintain in working order when made. He told me that in spite of this the Contracts Department, who had given them the order for fifty to sixty per month, wanted this number immediately increased to 100 complete engines per month, and fifty complete sets of spares per month. I asked him if this meant that they required cylinders as well, and he said that cylinders were one of the consumable spares."

Many of us know what a motor car is. How many of us when buying a motor car buy two or three dozen spare cylinders for the engine? What should we think of a salesman who tried to sell us a car and who not only recommended but insisted on undertaking that, on delivery, we should take four dozen spare cylinders for fear of a breakdown on the road? They have got motor cars running all over the country going to the factories of the people who are building them, and when they have got completed machines they tear the cylinders off, and I am told on good authority that the week before last in six days 1,800 spare cylinders were sent to France to keep some 200 or 300 engines going.

"I asked what the life of such an engine was, and he told me in many cases it did not exist for more than twenty-five hours."

When a pilot knows that, it must give him anxiously to think at what point that twenty-five hours is reached. Surely this House appreciates that the spare plant of an aeroplane is the crux of the whole problem. Should we supply our airmen with engines of Government design simply because some official has made some ghastly blunder which he has got to substantiate? He has spent hundreds of thousands it may be in experimental work which cannot be written off, and so he perpetuates his blunder, when all the time, if we wished to, we could be buying and building much more efficient engines. Only this morning it was brought to my notice that, not satisfied with this colossal blunder, another Department of the Royal Flying Corps is bringing out their own engines. This Department has had access ever since the outbreak of the War to all the drawings of all the engine people of this country. General Henderson said before the Committee that the Royal Aircraft Factory did not have access to the manufacturers' drawings of their engines. Well and good, but there is another Department which did, and that is the Department which is now bringing out this wonderful engine; and I would like to know what experience this gentleman, whose name I would be very pleased to hand to the hon. member for Rugby, has had for designing this engine? What right has he to waste Government time and Government money, even if we were not at war, and much more so when we are at war, in looking over the designs of private manufacturers, without slavishly following—if he did that it would not be so bad—but making improvements without knowing why they were done? What is the result? They produce an engine, and it is a failure. They give orders to one firm, to two firms, to three firms, whose names I will give the hon. member, and before the writing on the order is dry they carry out the tests after giving the order, and they find that the engine is inefficient, and this has got to be altered and that has got to be altered. They go round to the firms, and do not even ask permission, but simply cancel these orders. This is not a single case. It has been multiplied, and the engine I am speaking of now is not the engine to which I have been referring, but the engine they are trying to build up to take the place of that engine. It says here that they made up to the two hundred and fortieth engine over 4,000 scrap pieces or parts. There are hon. members in this House who know what a machine shop is, and perhaps, like me, they have worked in machine shops. You talk about 4,000 spare parts, and you read here that in very few cases of component parts does the scrap go down so low as 75 per cent. of the output. This is the official report, and what I want from the Government Bench is an assurance that this mechanical abortion shall be stopped before the adjournment of this House, so that for two months more we do not go on squandering money.

I am sure the £6,000,000 we are spending a day on the war would not justify my keeping the House for half a million or a million pounds spent between now and the reassembling of the House, but it concerns the lives of some of the best men of this country who come to me, although I cannot mention their names, and ask me to see that they get the best engine and the best machine. There is a very great deal more in this Report with which I do not propose to deal now, but I do ask that someone on the Government Bench will ask me for a copy of this Report and make some reassuring statement that the Committee of Inquiry will not leave such ghastly loopholes as this to destroy what little confidence they may have left. I have greater hopes for some of the other Committees which have been appointed recently, but I would ask the House to appreciate that the findings of this Air Committee and that the attitude of it, so far as it has been at present revealed to us, do not command the respect and confidence of this House or of the country.

Mr. Shortt: I do not propose to follow the hon. member into any of the more controversial matters which he has raised, but as he has made somewhat of an attack upon the Air Committee, of which I had the honour to be a member. I feel that I ought to let the House know something of the methods which that Committee adopted in their investigations. The Air Committee was appointed as a Committee which was to be presided over by a gentleman of judicial training and judicial mind. Our proposal was to invite, and we did indeed invite, evidence to be brought before us, not of a strictly legal kind, but the best evidence which anyone who had any suggestion to make, any criticism to make, or any charge to make against the Air Service could obtain. We heard, amongst others, the hon. member for East Herts, who has just spoken. Indeed, I may say that it was because of his charges of criminal negligence against the higher command of the Air Service—primarily, at any rate—that this Committee were appointed and constituted. We heard evidence, whether direct or indirect, whether of their own personal knowledge or by hearsay, from anyone who chose to come before us. We not only invited the hon. member for East Herts to come before us, but we gave him every opportunity to prepare his case. It is true—I do not make any complaint; I am merely reminding the House of the fact—that he treated us with considerable contempt; but eventually he did consent to come before us, and, as he had made charges, we were only too pleased that he should come and let us know what he knew and give us such information as he had got and as was available to him. He had provided for him some three postponements, going over a considerable number of weeks, in order to enable him to prepare the case which he had said in March of this year he was prepared at that moment to prove in this House to any individual member. But we gave him such time as he required.

Mr. Billing: On a point of order. I would like to point out that the postponements referred to were with the express intention of giving the Committee an opportunity of taking a holiday, which I cheerfully assented to—the postponement after the first 10 days.

Mr. Shortt: The hon. member's memory misleads him. We eventually had the hon. member before us, and he produced any amount of hearsay evidence. Of course, I quite appreciate his reason for refusing to mention any names. We appreciated that, and we heard all the hearsay evidence he had to bring before us. He brought no matter, no hearsay evidence which we could trace, to which we could attach a name or with regard to which we could ask for any person to be called before us. I mention that for this reason, that I am now going to tell the House what steps we took, as a Committee, to enable members of the Air Service to come before us without any possibility of their identity being known, either to Gen. Henderson or to anyone in the Higher Command. What we did was this: We asked gentlemen, like the hon. member for East Herts, to give us the names of any witness they desired should be called before us. We got from Gen. Henderson a complete list of all the members of the Air Service who happened to be in this country, and we chose a list, which embraced not only those witnesses whose names were given to us by critics of the Air Service, like the hon. member for Brentford (Mr. Joynson-Hicks) and the hon. member for Canterbury (Mr. Bennett-Goldney)—

Mr. Billing: Not by myself.

Mr. Shortt: Really, I think I might be allowed to go on with my speech. We not only embraced their names, but a large number of others. Their names were sent in to Headquarters, and every name we sent in was ordered to appear before the Committee. So that nobody knew that any particular witness was called before the Committee, and nobody, neither Gen. Henderson nor anyone else, knew which were the witnesses named by the hon. member for Hertford, if he did name any, which he did not, by the hon. members for Brentford or Canterbury, by Lord Montagu, or by anybody else. Therefore, it was perfectly safe for any member of the Air Service to come before the Committee and to give any evidence he chose.

Mr. Lynch: Might I ask if it was not the fact that two witnesses were identified afterwards, and were hauled over the coals by their superior officer for having given evidence?

Mr. Shortt: I did hear a complaint from Lord Montagu of one witness who, on his return from the Committee—the witness, by the way, was not called and did not give evidence—was embroiled in some way with the civil police, nothing to do with the military at all. That was the only case I did hear of. If the hon. member will tell me of any other, I am sure it will be looked into.

Mr. Lynch: There was the case raised in this very House. That was only one case.

Mr. Shortt: I cannot say. I have only heard of one, and I do not propose to detain the House any longer. These witnesses were able to come before us; they were examined without their names being disclosed. They were A, B, C, D, E; they were called by the critics. And the hon. member for East Herts was invited to call any witnesses that he chose—any witnesses. He was not only invited to call any witnesses. He was pressed over and over again to say whether the cases he brought before the Committee were those upon which he relied and were those to which he attached any importance. He was pressed by the learned judge to say whether he had any more cases to which he attached any importance at all, and he said he had not. He was asked whether he had any more documents to produce, and he had none. Of course, if a document had been produced to the Committee, we should have been able to see who was responsible for the document, and if the person was available we could have brought the person before us. The report which the hon. member has mentioned to-night we have never heard of. When there was a chance of their being cross-examined, he never mentioned them to us at all. We had such evidence as was available to us. We had the whole of the evidence that could be brought before us, and upon that we had to decide.

I do not propose to go into the question of the engine to which the hon. member has referred. I can only say this: that upon that we have not yet reported, therefore it would be most improper for me to offer anything at all to-night. We have only reported what our opinion is as to the "murder" charges. We have not yet reported upon any of the much wider questions that came before us, or the wider criticisms which came before us. Therefore I do not propose to say a word about them. I will only say that we have had a very large body of evidence with regard to the "B.E. 2 c," which is the machine the hon. member has most faithfully attacked, and with regard to the engine designed by the Royal Aircraft Factory. As the hon. member has once again used expressions which are calculated to cause considerable disquietude not only among the public but especially among those who have friends and relatives in the Air Service, I think I am entitled to say, without intimating in the slightest degree what the finding of the Committee may be, that the evidence with regard to that engine, its reliability, its usefulness, and with regard to the machine generally does not coincide with that of the hon. member. He may be right; they may be wrong. That is another matter. It would not be right for me to go into further detail of anything the hon. member has said, but I did wish the House to appreciate fully exactly what the Committee was doing, the methods it was adopting, and that we were attempting, as far as possible, to obtain all the information we could, and to do it, as far as possible, without disclosing the identity of any witness or of anybody who chose to come before us. I may say, in conclusion, that we have not yet finished. There is still an opportunity for the hon. member if he thinks that there is any evidence that he can bring which we have not yet had. If he thinks there is anything he can tell us that we do not know, we will welcome him. He can come, and he will have the same facilities to give his evidence and the same safeguards for any witnesses he may bring that he has had all through the investigation.

Major Baird (*representing the Air Board*): Everybody sympathises with the relatives and friends of people who have lost their lives as the result of Zeppelin raids; but we are at war, and that unfortunately involves loss of life. Up to now there have been thirty-four such raids. In ten no casualties occurred, and the total number of persons killed in the remainder was 334 civilians, and 50 military. That loss of life is very regrettable, but no one can say that it has had any influence on the conduct of the operations. The military damage caused by the raiders has been absolutely nil. I have received from the Commander-in-Chief and from my right hon. friend the authority to state that, if any hon. member who desires to be reassured or seeks information with regard to the defences in his own locality will come to the Air Board, the Board will satisfy him to the best of its ability. The Zeppelins have not got off so unscathed as people might imagine, and this is rather important to remember. We have destroyed, officially reported—in the "bag"—so to speak—seven of them. Five others have been damaged to such an extent that there is every reason to hope that they have been practically destroyed, but it is unwise to count them if you cannot be absolutely certain about them. The Allies, as a whole, have accounted for thirty-five Zeppelins. When you come to count the amount of damage that has been done, I am bound to say that I do not think we have any cause to complain.

Mr. Billing: Ask Admiral Jellicoe.

Major Baird: You must remember that the Germans have been preparing for forty years for war, and we have been preparing during the past forty years for perpetual peace. You cannot suddenly improvise defences to make up for the time and the opportunities you have lost, and the money you did not spend in all those years. What reception would any hon. member have got in this House, on whatever side he sat, if, four years ago even, he had suggested that we should spend £5,000,000 or £6,000,000 on defences against aircraft? We must make the best of it; the best of it is pretty good, and a good deal better than it is represented by hon. members. And hon. members should remember this, and it is necessary that they should realise this—it is very important—that the allocation of anti-aircraft guns, and of all artillery, must necessarily remain in the hands of the General Staff. They have to consider the whole problem from the military point of view. There is no possibility of considering it from any other point of view. You are waging a war, and you have not only got to consider the requirements of this country, but those of our Expeditionary Force in France, and of all the forces which we have operating in other parts of the world. You have to consider that problem as a whole, and to distribute your armament and defences in such a manner as to render the most efficient service, and to contribute to the best of our ability to defeat the enemy. That is the only possible way to look at it. The greatest service which hon. members can render—I hope they will allow me to say this—if they are not satisfied with the defences in their locality, or if they do not know what the defences are—is to come to us, to enable us to have the information given to them, and when they go down to their locality, to do their utmost to satisfy their neighbours and friends who live around them that everything possible is being done that can be done in the circumstances to secure them.

I do not know that I am called on to make any remarks with regard to the hon. member for East Herts. I wish he would remember that, though he is anxious for a reform of the Flying Corps, so am I. I should not be here if I were not. I approach the problem from a different point of view. But it really is no use his continuing these wild statements, because he has had a Committee set up to consider his complaints. The system of the hon. member seems to be this. A Committee is appointed to investigate the charges he makes. He is dissatisfied with the findings of that Committee, and he constitutes himself an Appeal Tribunal, and gives the appeal in his own favour. I do not think that is very convincing.

Mr. Pringle: He gets an article into a Sunday paper.

Major Baird: I know the hon. member is identified with the Press. But all these inquiries take up the time of officers who would be otherwise employed. People talk at large, but let us be business-like and, when the matter has been inquired into, accept the decision of the Committee. Who were the Committee? They were a very distinguished judge, two experienced and respected hon. members of this House, a very distinguished general, a lawyer, and two engineers. The Committee sat for twenty-two days. The hon. member occupied the whole of four days with the Committee, and part of two other days. That does not account for the time that he took up in cross-examination and examining witnesses. What Flying Corps in the world can show the record of our Flying Corps? I cannot imagine why the hon. member should use such expressions as he did, with all the experience and the very honourable record he has. Undoubtedly it does create a sense of disquiet and anxiety among the parents of these glorious young men who are serving in our Flying Corps. Morover, it is an anxiety which is not shared by the men behind the engines. It is quite gratuitous on the hon. member's part. The engine to which I think he referred—R.A.F. 1a—is one which may have all the merits he described.

Mr. Billing: The report was made last month.

Major Baird: I prefer to have the report of hundreds of officers who fly these engines, and not the report of an individual who, through a gross breach of confidence, has communicated with the hon. member, and who has gone down in the course of confidential work for the Government and made a report. He is not an expert on aeroplane engines. I am not going to discuss the merits or argue with the hon. member as to the value of the two reports. On the one hand you have the men who fly the engines abroad, and who say they are good engines. After all, they always "get you home"—that is the expression used in regard to them. On the other hand, you have the report to which the hon. member has referred. What earthly service is rendered by the hon. member to us, a country at war, who are building up day by day this Flying Corps, which is doing the most marvellous work? Nobody will deny that.

Mr. Billing: I say that the majority of the pilots do not approve of that engine.

Major Baird: The fact remains, if I may bring in a personal matter, that I have had much more experience of the Flying Corps than the hon. member, particularly that part of it dealing with engines. Obviously he is misinformed.

Mr. Pringle: The hon. and gallant gentleman has put the question to me whether I speak as an expert. The question put did not relate to any expert knowledge. It was as to the opinion of the men who do fly. I assert that their opinion is that of the hon. member for East Herts.

Major Baird: What is the hon. member's qualification for speaking as an expert.

Mr. Pringle: I am not.

Major Baird: I do not minimise for a moment the question whether the engine is good or bad, because it would be a scandal to send men up habitually to do work with bad engines if you can send up better ones. But we do not do anything of the kind. [Interruption.] The hon. member can go on repeating that as long as he likes.

Mr. Deputy-Speaker (Mr. Whitley): The hon. member (Mr. Billing) was listened to in complete silence in the long speech he made. The least he can do is to listen to the answer.

Mr. Billing: Is it not reasonable if the hon. gentleman makes a definite statement that I should have a right to express my disagreement?

Mr. Deputy-Speaker: There is a good deal more than that. The hon. member keeps up a running commentary of interjections which he has no right whatever to do. That is what I am asking him to refrain from.

Major Baird: I am authorised by the Secretary of State to extend to any other member the invitation I have already given, with a view to satisfying their friends. They must expect Zeppelin raids. As regards the specific points which have been raised, there is the question of lack of policy. At the beginning of the war, it is true, home defence was in the hands of the Navy. Since the beginning of this year it has been entirely in the hands, so far as land defences are concerned, of the Commander-in-Chief of the Home Forces, and he has a very complete scheme of aerial as well as other defence which is being carried out as rapidly as the guns and aeroplanes required can be provided. That has been arranged on a systematic plan, and I give the hon. member the assurance that no gun will be removed. I do hope that the hon. member will take this assurance that everything has been done, and is being done, to secure the best possible means of dealing with a very important matter.

LORD MONTAGU ON NEW ZEPPELINS.

At a meeting held at Bury St. Edmunds on August 23rd, with the object of starting a local branch of the Navy League, Lord Montagu of Beaulieu gave an address on Imperial Air Policy. In the course of this he referred to improved Zeppelins, and said these new airships had four points in which they were improvements—greater range, greater carrying capacity, greater speed, and greater power of climbing, a very important point. In round figures they had a capacity of nearly two million cubic ft., they were 780 ft. long, with a diameter of not quite 80 ft., and a maximum speed of 65 miles an hour, with a cruising speed of 35 miles, which was the most economical speed. Their radius of action at half-load was 3,000 miles, and they had a carrying capacity in bombs of about five tons as a maximum for coming over to England. They were also able to ascend to about 17,000 ft. when their load was discharged and all the engines, six or seven, were working. At 17,000 ft. he was quite safe in saying they had very few anti-aircraft guns that could do very much harm. Moreover, a Zeppelin at 17,000 ft., though it might have great difficulty in hitting a definite place, had an advantage in attacking large areas such as Cambridge, Norwich, or London, in that they could not fail to hit and do damage. The engine-power of the new ships was over 1,500 horse-power, and they had several quick-firers and machine-guns in the bow and stern, and guns on the top to ward off aeroplanes. The crew would number about 30 or 35. That showed to what extent the Germans were relying, he hoped falsely, upon Zeppelins as a means of harassing them and showing their military power. Of these new monsters, three or four would be available by about the beginning or middle of October, and from his information two of them had already been manœuvring, one over the North Sea and the other over Germany.

Turning to what England was doing, Lord Montagu said that it would not be right of him to say that he thought the Government were wholly to blame. What really happened was that at the beginning of the war very few people realised that the menace was a serious one at all, and even at present he said deliberately that the greatest use of airships in his opinion would be in the future not the bombing of defenceless towns, but as eyes of the Fleet. If they had a proper service of rigid airships to work as eyes for the Fleet, there would not be half the necessity for imperilling their cruisers which acted as scouts. It was a curious fact that nearly all the cruisers they had lost since the beginning of the war had been out on missions of reconnaissance.

Dealing with the work at the Front, Lord Montagu said they were making more raids upon important points on the enemy's lines of communication and depôts, and already some of the Zeppelin sheds had been wrecked with good effect, and they had aeroplanes which were faster, and therefore could tackle the much-famed Fokker. Already a certain type of new aeroplane which had been lately working at the Front had accounted for no less than 27 Fokkers since it had been flying in France.

Regarding the Royal Naval Air Service, Lord Montagu urged that there should be a Naval Air Lord on the Board of Admiralty, and that was one of the reforms the Parliamentary Air Committee would press for when Parliament met again in October. The Parliamentary Committee was on friendly terms with the Air Board, of which Lord Curzon was the chairman. Before long he predicted there was danger of a crisis, because the views of the Air Board would not coincide with the views of the Admiralty and the War Office. Then would be the time for the Government, urged on by Parliament and the people of the country, to decide that the alert and progressive Air Board should be free from any service jealousy and inter-departmental quarrels and the chaotic conditions which existed at present.

On the motion of Capt. Alan Burgoyne, M.P., seconded by Mr. P. J. Hannon, the following resolution was passed:—

"In the opinion of this meeting, representative of the people of Suffolk, the adoption of an Imperial air policy following upon the war is a national question of pressing importance; the construction of a fleet of large, rigid airships should be promoted by His Majesty's Government with all the expedition possible; the necessity of co-ordination of activities between the Admiralty and the War Office, in order to increase aircraft efficiency in all its branches, is strongly recommended to the Cabinet; and that that object can best be achieved by enlarging the powers of the Air Board."

The Fatal Mid-Air Collision.

At an inquest on Lieut. G. Rogers and Second-Lieut. C. de Frece on August 23rd, Second-Lieut. W. S. F. Saundby said he was flying at a height of 2,000 ft. when he was overtaken by the machine piloted by Lieut. Rogers. Thinking Lieut. Rogers desired him to fly as target for his camera attachment, he did so, afterwards dropping 500 ft. Lieut. Rogers began descending, and, to avoid the possibility of collision, Lieut. Saundby "flattened out" and the propeller struck the tail of the other machine, which, becoming unmanageable, nose-dived to earth. Lieut. Saundby's machine spiralled safely to the ground.

The jury returned a verdict of accidental death, with no blame attaching to anyone.

AIRISMS FROM THE FOUR WINDS.

The United States has just voted about $14,000,000 for their aircraft fleet, which is not so bad during peace times. Wish our side had been as generous in the days gone by. One thing, if the war goes on for about another couple of years, as some folk seem to think, we'll surely have to go one better, so as help us annex America. It will be the only way out of it. They've got—or will have by that time—all our money, and anyway annexation is about the simplest way for readjusting the balance, as the whole nation will probably be so fed up with wealth and ineffeteness through over-indulgence, that it would be a charity to relieve them of it that way, so they may pull themselves together again, out of the lap of war-begotten luxuriousness. President Wilson knows his business.

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The R.F.C. can fly, but they cannot play cricket ; or was it their unlucky day ? On Saturday they could only make 13 against the 13th Reserve Cavalry, who totalled 73 runs. Corpl. Coleman took five wickets for six runs and Pte. Murgatroyd the other five for seven.

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The old type Wright control has been responsible for a good many things.

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For instance, the combination of using warp and rudder simultaneously has figured prominently in patent law suits in America.

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Lately it has been the (innocent) cause of a new pupil coming in for a good deal of "ragging" out Hendon way.

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The Wright-type rudder lever, mounted as it is on the top of the warp lever, does remind one of motor car practice. So, apparently, thought the pupil, when he innocently asked *if that little lever put the brake on.*

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Sorry to hear that W. L. Brock, the winner of the three great air races in 1914, has retired from actual air work. Early in the war, it may be remembered, Brock returned to his native land, U.S.A., where he was engaged in testing and other branches of piloting, and according to report received Brock had a mishap in landing, the machine turning over, the hot radiator water scalding him pretty badly.

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From what we can gather, he is not to do any more actual flying, but his services are turned to good account in another direction, as he is now working in the drawing offices of one of the American aircraft firms. He will, without doubt, give a good account of himself, for, although it may not be generally known, Brock was as well versed in the theory of design as he was in the handling of machines built by others.

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Pupils are now being drafted out by the War Office to the various civilian schools in batches. On Saturday last some of them had their *baptême de l'air*, while others were receiving useful instruction in erecting and rigging. Altogether our one time civilian aerodromes are assuming quite a military aspect just now.

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The aeroplane for business purposes is not so far off as some people would imagine. Already there are several instances on record of it being employed in preference to other means of locomotion. Not long ago a Staff officer from the War Office had occasion to go to the west of England on matters relating to a new school. What was more natural than that he should go by air ? Which is exactly what he did. A sign of the times, we should say.

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Shark-shooting from a flying boat is the latest form of sport hailing from America.

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The Gallaudet 300 h.p. bisected-fuselage-pusher-hydro-biplane, illustrated in "Flight" the other week, has flown. It was tried out by Pilot McCulloch near Norwich, Conn., towards the end of July, and put up quite a creditable performance, making 90 m.p.h.

– – –

Looking remarkably well, Ding was having a day in town last week as a change from being up in the air most of his time testing. Mentioned a 100 h.p. monoplane Blackburn's are building for him, and threatens to bring it to Hendon and make some of us sit up.

Ding had great things to say about the B.E., of which he has been testing quite a lot. In his view you can do what you like with them except play fool tricks near the ground. Should like to see him in that new stunt of his. High up for a tail slide, he holds her so she can neither tail-slide nor nose-dive, but just gently floats downward so long as he cares to hold her there. Others thinking of copying, please remember that he said "high up."

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Don't quite see how the elevator could keep a machine from nose-diving when there is little or no forward speed on, but there you are, Ding says he does it. *Ab uno disce omnes.*

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The new L. and P. single-seater biplane, which is to be fitted with a 50 h.p. Gnome, will form a good stepping-stone to the scouting type of machine that many of the pupils will have to fly after leaving the school. Its appearance in public should only be a matter of a few weeks now.

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For some little time one clear indication of the entry of Roumania in the war against the Germanic Powers has been the blue shades on the lamps of Bucharest as a protection against Zeppelins.

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Miss Katherine Stinson may be going to Australia before long.

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One feature of her "show" is a race between a machine piloted by herself and a Peugeot racing car, with Dario Resta at the wheel. Some show !

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They raced at the Sheepshead Bay track, New York, for the "Championship of the Universe" recently. Some enterprise !

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The *Brooklyn Eagle* says Miss Stinson "won by inches," but the *New York Press* puts it as "several yards." Some close measuring !

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A German writer, trying to make our flesh creep with tales of Super-Zeppelins, closes ecstatically with the words : "Woe to you Paris, woe to you London." To which we reply : "Whoa, Zep. !"—*The Star.*

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The "Pickles-Prodger" combination is still going strong, and both partners are, and have been for some time past, extremely busy testing various kinds of 'buses. Some of these latter are fair startlers according to the reports of both units of the combination.

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It is rumoured that a third partner is being joined up shortly—but there . . .

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Anyway, here's congratulations to you and yours, Sydney Pickles !

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As a rule aero-passengers thoroughly enjoy their first experiences of flying, but the initiate who was heard to say at the conclusion of a flight—a rather "bumpy" one, it is true—"Why on earth do they call them 'joy rides'?" must have been an exception.

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Good news to hand of Louis Noel of Hendon, who says things are very lively in the air just now in the Near East.

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He won great distinction in the recent bombardment of Sofia, whereby he was promoted to the rank of Sous-Lieutenant. Well done, Noel ; may you attain still higher altitudes.

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Another recruit to the ranks of aeroplane constructors has been obtained. H. C. Nestler, of portable hangar fame, has blossomed out with one or two very promising designs.

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One of these is a very neat little tractor scout, which is expected to do—no, 'praps better to dissemble these Defence of the Realm Censor days.

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After coming safely through the Zep. raid the other night, a house on the outskirts of London was struck by lightning. It nearly demolished the chimney-stack, sent the fender and fireirons flying across the room, and covered the occupants with soot. A bomb might have been worse, of course, but it does seem to be something like the retired steeplejack who fell downstairs and broke his neck, doesn't it ?

Personals

Under the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriage and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Second-Lieutenant H. **Floyd**, R.F.C., who has died of wounds in Germany, where he was a prisoner of war, was 21 years of age. He was the only son of Dr. Floyd, of Kilkeel, Co. Down, and was formerly a despatch rider in the Royal Engineers. He was severely wounded on August 9th, while flying over the German lines, and was taken prisoner.

Flight-Commander **Basil Hallam Radford**, better known to theatre-goers as Mr. Basil Hallam, the original "Gilbert the Filbert," who was killed in France on August 20th, was attached to the Kite Balloon Section of the R.F.C. The balloon in which he was observing broke away, and, having thrown all the papers overboard, he tried to descend by his parachute. It failed to open, however, and he received fatal injuries. Mr. Hallam, who was educated at Charterhouse and Oxford, made his first appearance on the stage under Sir Herbert Tree, in 1908, playing in a number of Shakespearean productions. He scored considerable success as the Hon. Archie Graham in "The Blindness of Virtue"; but the production of "The Passing Show" at the Palace Theatre in April, 1914, established, in a single night, his position in the first rank of light comedians. Mr. Hallam played the part of a typical pre-war "nut," and his song, "Gilbert the Filbert" was soon sung and whistled all over England. With Miss Elsie Janis he also appeared in the next Palace *revue*, "The Passing Show of 1915," and there was great enthusiasm at his farewell performance in June of last year. Mr. Hallam was also a capital dancer, but he danced with difficulty, for an old injury to his leg necessitated the wearing of a steel plate. It also prevented his joining an infantry regiment, as he wished to do at the outbreak of war. He was the youngest son of Mr. and Mrs. W. T. H. Radford, of 25, Park Crescent, W. (who already have to mourn the loss of another son, who was in the Berkshire Regiment). Captain Radford first went to the Motor Transport service, and afterwards joined the Kite Balloon Section, R.F.C., last summer, being appointed Flight-Commander (Temporary Captain) on June 9th, 1916. A memorial service will be held on Friday of this week (September 1st) at St. Paul's, Knightsbridge, at 12 noon.

Lieutenant **William Stobart** ("Buff"), Durham Light Infantry, attached R.F.C., who was killed on August 24th, in his 22nd year, was the second son of Mr. and Mrs. F. W. Stobart, of Bromham Hall, Bedford. He was born in Winnipeg, Canada, and was educated at Rugby and Jesus College, Cambridge, where he rowed bow of the Head of the River boat in the Lent Races of 1914. He also rowed seven in his college eight in the final for the Thames Cup at Henley the same year. He was in Canada when war broke out, but he immediately returned to England, and joined the Durham Light Infantry. He had been twice slightly wounded, and was appointed to the R.F.C. last April. Gaining his wings in less than two months, he joined his squadron abroad at once.

Captain G. W. **Webb**, Royal Irish Rifles, attached R.F.C., who was reported missing on July 1st, is now stated to have been killed on that date. A letter received from Lieutenant Tudor-Hart, Northumberland Fusiliers, attached R.F.C., now a prisoner of war in Germany, who was Captain Webb's observer, shows that they were flying for an hour over about 6 miles of German lines when they were attacked by a number of enemy aeroplanes, the Captain being shot dead. He had served in the 2nd Battalion Royal Irish Rifles until last year, when he was wounded, and he joined the Flying Corps after he had recovered. He was the son of the late Mr. R. T. Webb, Rath House, Knock, Belfast.

Second Lieutenant **Humphrey Pearman**, R.F.C., died on August 13th as the result of burns caused by the fall of an aeroplane owing to engine trouble. The branch of a tree penetrated the petrol tank while the machine was falling, and the aeroplane burst into flames. Mr. Pearman, who was the younger son of Mr. D. Pearman, of Elm Cottage, Purley, joined the H.A.C. in August, 1914, went to France in the following month, and became Second Lieutenant in the 2nd Battalion Leinster Regiment in March, 1915. He was wounded at Hooge last August, invalided home in September, and entered the R.F.C. last March, receiving his "wings" in June.

Missing.

Flight-Commander **George B. Dacre**, D.S.O., R.N., who is reported as missing, was one of our pioneer airmen, for he took his certificate on November 28th, 1911, on a Bristol biplane at the Bristol School, Salisbury Plain. He joined the Naval Air Service and became Flight-Lieutenant in December, 1914, subsequently going to the Dardanelles, where he gained the D.S.O. in November, 1915, for flying over the Gallipoli Peninsula and carrying out a difficult operation in spite of serious trouble with his machine, displaying great nerve and courage in prosecuting an attack under very adverse conditions. Flight-Commander Dacre is the son of Dr. John Dacre, of Eaton Crescent, Bristol. He is 24 years of age, and was educated at Clifton. Two other brothers are serving their country, one in the Royal Field Artillery and the other in the R.A.M.C.

Married and to be Married.

Second Lieutenant W. **Edward Birch**, son of Mr. James Birch, Sefton, of the R.F.C., who has a German Fokker to his credit in France, was married at Ormskirk Parish Church on August 23rd to Miss **Eva Stretch**, daughter of the late Mr. Edward C. Stretch, auctioneer and estate agent, of Ormskirk.

Captain **Arthur Travers Harris**, Flight-Commander R.F.C., was last Wednesday married to Miss **Barbara Kyrle Money** at St. Augustine's Church, Queen's Gate.

A marriage has been arranged, and will shortly take place, between **Cuthbert Julian Orde**, Lieutenant, R.F.C., second son of Mr. and Mrs. Julian Orde, and Lady **Eileen Wellesley**, younger daughter of the Duke and Duchess of Wellington.

An engagement is announced, and a marriage will shortly take place, between Flight Sub-Lieutenant **Arthur Watts Williams**, R.N., son of the late Mr. James Williams, of Brynglas, Newport, Monmouthshire, and Mrs. Williams, of 37, Courtfield Road, S.W., and **Lettice Mabel**, only daughter of Mr. **Wilfred Becker** and Mrs. **Becker**, of Bowden Hall, Chapel-en-le-Frith, Derbyshire.

Items.

Sir William Beardmore, who has been appointed one of the Science Committee for reviewing, in conjunction with a Committee on Modern Languages, our system of education as a whole, is chairman and managing-director of Messrs. William Beadmore and Co., engineers, of Parkhead Forge, Glasgow, chairman of Messrs. Arrol-Johnston, a director of Messrs. Vickers and several other important industrial undertakings. Probably no more valuable selection could have been made for this highly important Committee than Sir William.

The will has been proved of Flight-Lieutenant **Geoffrey Richard Henry Talbot**, R.N.A.S., of Little Gaddesden House, Berkhamsted, Herts, who was killed at Dover on June 29th when starting on a flight to France, younger son of the Hon. Alfred Talbot, grandson of the 18th Earl of Shrewsbury, at £13,879.

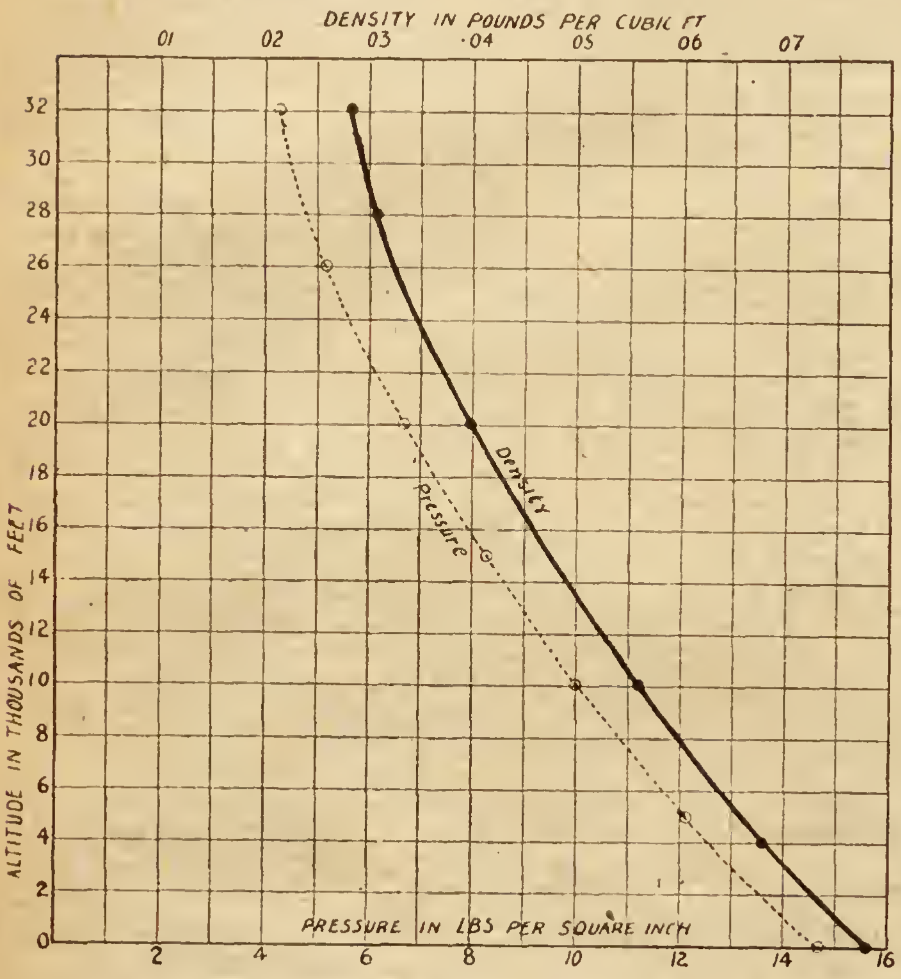
The managers of the Princesses' Theatre in Kent, which was erected by Messrs. Vickers, Ltd., have sent a cheque for £75 7s. to Princess Victoria of Schleswig-Holstein's Y.M.C.A. Auxiliary Committee for providing concerts for the troops at the hospitals and recreation huts in England and France. This sum represents the total amount received from the sale of tickets for the opening performance.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to " FLIGHT *" about it.*

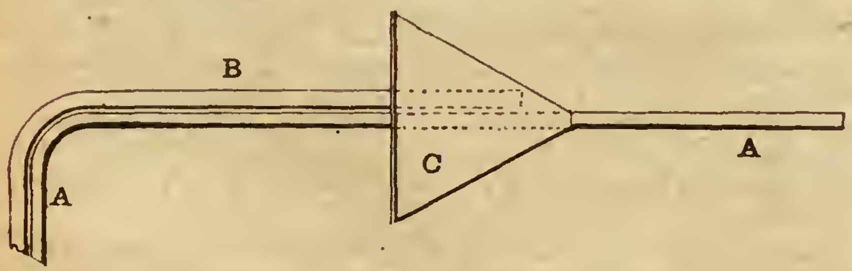
H. C. B. (King's Lynn).

The accompanying graph will show you the relationship between altitude and density, and altitude and pressure. If it were not for the fact that the temperature decreases with altitude, pressure and density would decrease at the same rate. The temperature decreases at a fairly well defined rate, although subject to very considerable variations locally. From the figures available of temperatures at different altitudes, it is possible to calculate, by taking account of these temperatures, the density or weight of a cubic foot of air over the same range of altitudes. To do this the general formula $pv = GRT$ is employed, in which p = the pressure per square inch, v = the volume, G = the weight, T = the absolute temperature, and R = a constant, which for air has the value 0·37. By finding from this equation the weight of a cubic foot of air at the temperatures and pressures corresponding to the various altitudes, the altitude-density curve is obtained.



N. W. H. (Beddington).

Various types of Pitot tubes are in use for measuring the *air speed* of an aeroplane. A form commonly employed is shown in the accompanying diagram. It consists of a Pitot tube, A, facing the direction of flight, and of a suction tube, B, having its mouth sheltered behind the cone C. The two tubes are connected up to the two sides of an indicator, which shows the speed of the machine. The difference between the static pressure and the pressure in the cone at the mouth of the suction tube is proportional to v^2.



It should be realised that the speed measured by the Pitot tube is the relative speed between the machine and the surrounding air, and not the speed relative to the ground. Thus, if a machine has a speed of 60 m.p.h. and is flying against a wind of the same velocity, the Pitot tube will still indicate 60 m.p.h., although the machine is stationary in relation to the ground.

J. B. (Chichester).

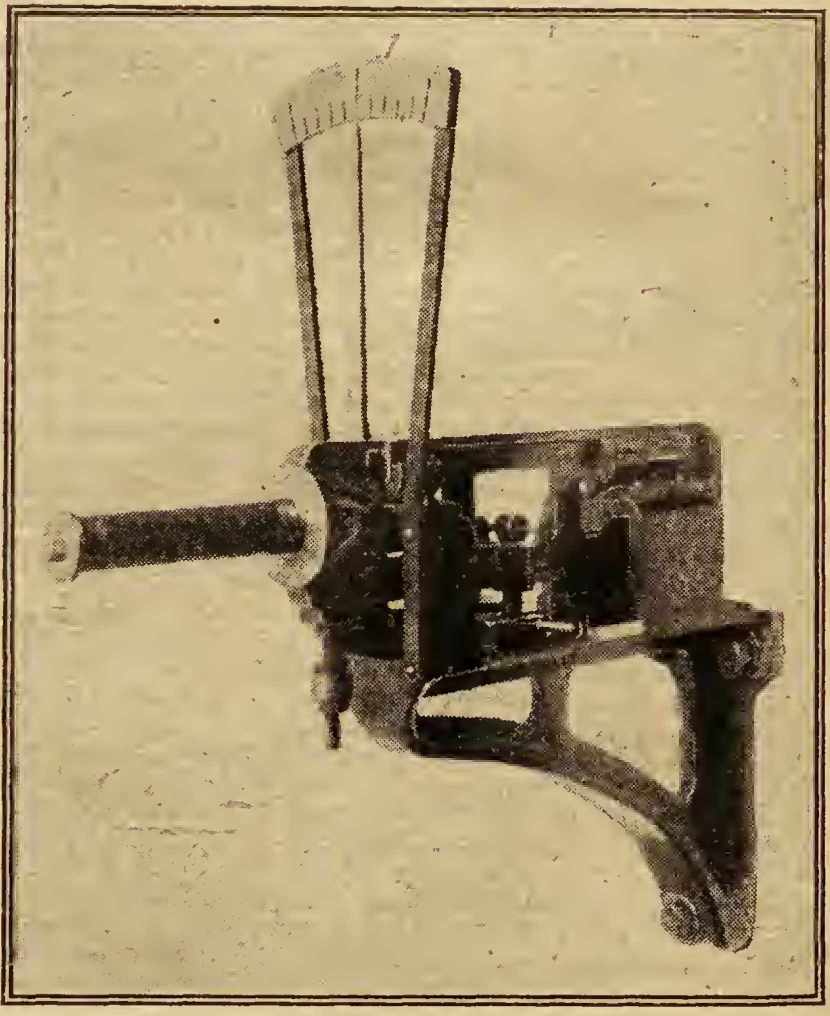
When a machine "bounces" on landing it may be due to various causes. If the landing is somewhat heavy, almost any machine that is not fitted with means for absorbing the rebound will bounce. At other times a machine may go through a series of slight bounces in quick succession. This is not infrequently caused by too hard and stiff shock absorbers. Good quality rubber does not have so great tendency to do so.

In some machines the wheels are a considerable distance in front of the centre of gravity of the machine. The usual distance is about 1 ft. If greater than that there is the danger that on landing the tail will drop too rapidly, thereby increasing the angle of incidence of the wings, which will, if the machine still has sufficient speed on, result in her taking the air again, sometimes making a leap of several feet in height.

□ □ □ □

TO BALANCE PROPELLERS.

It is, of course, a well-known fact that, in order to ensure smooth running, it is of the utmost importance that a propeller should be perfectly balanced. Any small deviation from this desirable state may easily result, not only in marked vibration, but may even assume proportions which would in a short time ruin the engine. For instance, if a propeller which weighs 30 lbs. and has a diameter of 8 ft. rotates at a speed of 1,200 r.p.m., and its centre of gravity is situated one-tenth of an inch from the propeller axis, the centrifugal force will be $\frac{30 \times 1,600\pi^2}{32 \times 120}$ = 125 lbs. approximately. Testing the balance of a propeller is, therefore, an operation requiring very delicate instruments. We have received from Messrs. W. and T. Avery, Soho Foundry, Birmingham, the well-known manufacturers of weighing and testing machines of various kinds, particulars of a new propeller-balancing apparatus, which works on the static principle, the propeller being revolved axially instead of diametrically. Friction is reduced to a minimum by the use of knife edges. The instrument is mounted on an iron bracket, and is provided with a zero pointer and graduated scale. Propellers of any weight and diameter can be tested on this apparatus, which will, we understand, be on view shortly at the London show rooms of the firm, when propeller manufacturers and others interested would be well advised to avail themselves of the opportunity of an inspection.



The Avery propeller balance testing machine.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (*France*), *August 23rd*, 9.13 *p.m.*

"When the weather cleared yesterday evening the enemy's aircraft, which displayed unwonted enterprise, were engaged in large numbers with most satisfactory results. Fighting was continuous until dusk, and at least four hostile machines were destroyed, and many others driven down, damaged and apparently out of control. Others were pursued to their aerodromes. We suffered no casualties.

"Despite continual fighting, a reconnaissance was completed successfully, and bombing raids were carried out against sundry points of importance."

General Headquarters, August 25th, 10.45 *p.m.*

"Two aeroplane raids were carried out by us against some of the principal railway sidings on the enemy's lines of communication. Several trains were hit and considerable damage caused to enemy's rolling-stock. Other points of military importance were also bombed.

"Hostile aircraft generally avoided combat, but there were some engagements in which a number of enemy machines were damaged and driven down. One of our machines was brought down by enemy guns."

General Headquarters, August 26th, 10 *p.m.*

"Our aircraft carried out many attacks on points of military importance behind the enemy's lines, dropping in all about 5 tons of bombs. One hostile machine was brought down, and at least one other driven down damaged. Two of our machines are missing."

War Office, August 26th.

"*Salonica.*—Our aeroplanes bombed enemy camps at Kula Topolca and Prosenik (about 6 miles south of Demirhissar)."

General Headquarters, August 28th, 9.38 *p.m.*

"On the evening of the 26th a heavy storm overtook eight of our aeroplanes, and five of them have not returned."

French. *Paris, August 22nd. Afternoon.*

"Yesterday one of our pilots brought down an Albatros, which was smashed on the ground near Languevoisin, south-east of Nesles (south of the Somme). Four enemy biplanes, which were attacked at close quarters, fled in a damaged condition. Last night one of our squadrons dropped 79 bombs on the railway stations and lines of Tergnier and Noyon, the waterworks at Pont l'Evêque (Oise) and the station at Appilly. Our pilots noticed that violent fires broke out in these places. All the machines returned safely."

Paris, August 23rd. Afternoon.

"On the Somme front Adjudant Dorme brought down his fifth German aeroplane, which fell in the direction of Moislains (north-east of Péronne). Four other enemy aeroplanes which were fired upon by our machine guns came down severely damaged in their own lines"

Paris, August 23rd. Evening.

"Adjudant Dorme brought down his sixth aeroplane, which fell in the region of Marche-le-Pot, north-west of Chaulnes. Another enemy aeroplane was brought down in the region of Roye."

Paris, August 24th. Afternoon.

"On August 22nd, on the Somme front, one of our pilots who was attacked by three enemy machines succeeded in beating off his adversaries and brought down one of them, who fell crashing to the ground near Athies (region of Hem).

"Yesterday an Albatros was brought down by our men in the neighbourhood of Epoye (north-east of Rheims). Two other German machines dived headlong into their lines, one in Champagne and the other in the Vosges."

Paris, August 25th. Afternoon.

"Yesterday one of our pilots brought down a German biplane, which fell crashing to the ground near Gremecy (north-east of Nancy)."

Paris, August 26th. Afternoon.

"On the whole of the front our air service was particularly active yesterday, and fought a number of fights with the enemy, in the course of which it clearly showed its superiority. In the region of the Somme three German machines were brought down, one by Lieut. Nungesser, who thus brought down his eleventh enemy machine. The second was brought down by Warrant Officer Dorne, being his seventh success up to date. The third enemy machine fell near Pertain. Three other machines were bombarded with machine guns at close quarters by our pilots and came down sharply in a damaged condition.

"Near Craonne our anti-aircraft guns brought down a Fokker. North of Châlons a Fokker which was attacked and chased fell headlong in its own lines and was smashed to bits. In the region of Verdun a German aeroplane was brought down in flames. Towards Mogeville two others were badly hit and came down in a damaged state, one in the Forest of Spincourt and the other near Foamex. In the region of Pont-à-Mousson a Fokker was put out of action.

"Elsewhere two German captive balloons were set on fire by our airmen, one north of the Aisne (in the region of Paissy) and the other on the Somme front towards Mesnil St. Nicaize. Finally it is confirmed that on August 23rd a German captive balloon was brought down by our anti-aircraft guns and fell in flames towards Hézonveaux (in the region of Verdun).

"Last night an enemy aeroplane dropped eight bombs on Baccarat. The material damage was insignificant. One person is reported to have been slightly wounded."

Paris, August 28th. Evening.

"Sub-Lieutenants de Ullin and De La Tour felled their fifth German aeroplane, the former on August 24th and the latter on August 25th."

Russian. *Petrograd, August 23rd. Afternoon.*

"Over 100 bombs were dropped by enemy aeroplanes on the railway station of Manevichi."

Petrograd, August 27th. Afternoon.

"Enemy airships flew over our positions on the Drisviaty Lake and dropped bombs, killing the chaplain, Father Joakim Sedletski, while he was fulfilling his pastoral duties."

Italian. *Rome, August 24th.*

"Along the remainder of the Front intermittent artillery action and activity of aircraft and reconnoitring detachments are reported. During an air fight above Gorizia one of our Nieuport machines brought down an enemy aeroplane, which fell in flames near Ranziano."

Rome, August 26th.

"One of our air squadrons bombarded the railway station of San Cristoforo, north of the lake of Caldonazzo (Brenta), causing heavy damage. All our machines returned except one. Above Gorizia, after lively air fighting, one of our aviators forced a hostile aeroplane to land in the neighbourhood of Aisovizza."

German. *Berlin, August 24th.*

"During the past few days four enemy aeroplanes have been shot down, two of them in air fights respectively at Bazentin and west of Péronne, and the other two by anti-aircraft fire near Richebourg and La Bassée."

Berlin, August 25th.

"Four enemy aeroplanes have been brought down north of the Somme—one each in aerial engagements near Point Faverger, to the south of Varennes, and near Fleury (this latter machine on the 23rd inst.), and one south of Armentières by means of anti-aircraft guns.

"As has frequently been the case of late with regard to Belgian towns, bombs were yesterday dropped on Mons. In addition to important material damage to Belgian property, some citizens were severely injured."

Berlin, August 26th.

"Two enemy aeroplanes were shot down by machine gun fire near Bapaume, and anti-aircraft fire brought one down at Zonnebeke, in Flanders. In air fights two aeroplanes were shot down respectively east of Verdun and north of Fresnes (Woevre)."

Austrian. *Vienna, August 26th.*

"Near Lusern Lieut. von Sielder shot down a Caproni aeroplane."

Turkish. *Constantinople, August 26th.*

"A hostile aeroplane mistakenly fired on the British troops with machine gun, keeping up its fire for a quarter of an hour."

From Other Sources.

Reuter's correspondent at Salonica, writing on August 13th, says:—

"A German observation balloon beyond Doiran keeps close watch on our position, and whenever a fresh gun gives a hint of its approximate whereabouts a searching fire from the Bulgarian big guns is certain pretty soon to follow. The sausage balloon keeps constantly altering its altitude, and disappears entirely as soon as an Allied aeroplane heaves in sight."

A Reuter message from Petrograd on August 15th, regarding the line of retreat in Galicia, says:—

"Russian aviators have reconnoitred numerous strong enemy positions on the lines of retreat."

Writing on August 16th regarding the events of the previous day in the Picardy area, the *Petit Parisien* states:—

"With untiring ardour and remarkable success the gunners bombarded the German positions and battery emplacements as indicated to them by our airmen, who at each flight brought back information of such precision that in the great majority of instances within a quarter of an hour of the return of the observing airman our artillery was able to direct a sure and intense fire upon the German 21-centimetre guns, or on groups of lighter guns."

Mr. G. H. Perris, the correspondent of the *Daily Chronicle* with the French armies on the Somme, on August 15th writes:—

"Perhaps the clearest and most important advantage the Allies have had in the Somme offensive is the dominant superiority of their air services. It was an essential part of the plan of the French General Staff that this advantage should be gained at the outset, for an enemy driven out of the sky is half blinded. When the big guns commenced their destructive cannonade of the German trenches, therefore, squadrillas of aeroplanes were sent forward to bring down or drive back the enemy aviators and to destroy the 'sausage' observation balloons. Both sorts of raid were carried out with the utmost daring and success.

"Before the infantry advance began the familiar 'drachen' had been either destroyed or hurriedly hauled down, and the once formidable German pilots dared not show their noses over the French lines. In five days on the British and French fronts 15 captive balloons were destroyed. Meanwhile our other squadrillas were ceaselessly engaged in their severa tasks of bombardment or observation over the enemy's positions.

A POPULAR R.F.C. OFFICER NOW IN AMERICA. —**Mr. Phil Rader, editor, artist, printer and publisher of the late amusing journal the *Jersey Brow Gazette*, Lieut. Rader is now in Buffalo instructing Harvard aviation students.**

"That such an important advantage should be seized is comprehensible. It is more difficult to understand how it has been maintained. I do not think our men would suggest that the Germans lack courage, though they are less daring than the French. Many of the best German aviators have been killed, others, no doubt, are kept on the Russian front, for the war of movement requires air scouts more urgently than the siege warfare of the West. Whatever the explanation may be, the fact is beyond doubt. At one point on the Santerre plateau I counted 23 French 'sausages' dragging at a great height upon their cables, and only two that could be German, of which one was doubtful. French aeroplanes of all types came and went on their patrol duties with the freedom of pigeons over a farmyard, but if there was any combat in the air it did not take place over the French lines.

"I visited one of their many aviation parks, and was deeply impressed by the immense progress that has been made during the war on every side of this enterprise under the stimulus of military necessity and individual skill and pluck. The technique of different types of plane and of their engines and machine guns is beyond me; but the handsome, radiant face of the captain who explained to us some of the mysteries of his squadrilla of 'Baby Nieuports' spoke volumes. It was a picture of keen intelligence and physical fitness. As we stood by, Guynemer swept down from cloudland to our feet as easily as a Great Northern driver brings his engine into King's Cross or the middy his steam launch up to the landing at Cowes. He looked sallow, for it is bitterly cold at a height of two miles when you are running at 100 miles an hour; but there is something of nervous strength in the almost girlish figure, a swift certitude of eye and hand that you would feel to be exceptional even if you knew nothing of his record. Aviation is essentially a young man's service.

"The technique is no harder than that of the artillery, perhaps not so hard; but the highest intensity and most perfect balance of youthful physique are more necessary than in any other arm. It is the light cavalry of modern warfare, and along with a chivalry all its own it is developing a whole series of special functions.

"There are the individual scouts whose business it is to serve the field or heavy batteries, watching every shot and correcting the range by wireless or various kinds of signals. Other observers have the more general task of photographing the enemy's lines, so that the whereabouts of a new trench fieldwork or railway, new concentration of troops or guns, may be immediately known. Then there are what the French call *avions de chasse* and cannon-planes, who must seek out and attack enemy aeroplanes and balloons and forbid access to our own lines. Finally, there are the squadrillas of bombardment, whose raids into German territory have become more and more frequent and extensive of late.

"The importance of the mastery the French have obtained in every one of these functions is evident. It means that the offensive army saw twice as much as the defensive, that the costs in life and limb inevitable to an attack upon modern fieldworks were reduced to a minimum, and that the whole depth of the French Front was, and, is, comparatively immune from effective bombardment. There is, perhaps, no clearer index of the changing fortunes of the war.

"Some able French writers have been warning their countrymen during the last few days that the Germans are bound soon to attempt a counter-offensive in the West, even if it prove as costly as the ill-starred adventure against Verdun. This is perfectly sound advice. With three-fifths of the German armies nailed down before our trenches, we must at least expect powerful local attacks. But, setting aside the root question of their exhausted reserves, I do not see how they can attempt anything like a large offensive without first winning back at least an equality in the air services. And of that there is no present prospect, at least in Picardy and Santerre."

In a semi-official statement issued in Paris on August 17th, a description by a German prisoner of the bombardment of St. Quentin railway station by the British is quoted. He said:—

"At the end of June, the 22nd Reserve Division, to which my regiment was attached, was sent to rest in the neighbourhood of St. Quentin. An order came to us on July 10th to proceed to the Somme front. About 3 o'clock in the afternoon the 1st battalion of the 71st Reserve Regiment and the 11th Reserve Battalion of Jaeger were in St. Quentin Station ready to entrain. We had placed our arms and equipment in the carriages.

"At this moment some British aeroplanes appeared and dropped bombs. One fell on a building full of ammunition and caused a violent explosion. There were 200 ammunition wagons in the station and 60 exploded. The remainder were only saved with difficulty.

"The train which was to have carried the troops, together with all the equipment and baggage, was destroyed, in addition to a large quantity of war materials stored on the platforms. The men, seized with panic, fled in all directions. A hundred men of the 71st Regiment and 80 men of the 11th Jaeger were killed or wounded. It was not before several hours that it was possible to reassemble the battalion of the 71st Regiment, which was sent to rest, and the next day it entrained at another station in order to be entirely re-equipped. Afterwards the battalion was sent to Péronne, where it was placed in reserve before going into action."

The *Times* correspondent at the British Headquarters, writing on August 16th, says:—

"Next to the infantry in his trenches, I am inclined to think that those among the enemy's fighting men who have the worst time nowadays are his airmen. They must try to cross our lines for observation purposes, and if they fly high they get hunted and beaten down by our machines, while at anything less than the highest altitudes they become the target of our anti-aircraft guns.

"I know one 'Archie' which has brought down two enemy machines in the last four days; and, among all the different branches which are helping in this battle, I am not sure that the men with the anti-aircraft guns have had their proper share of appreciation. It is they who keep the enemy machines up too high for useful observation, and night and day they lead a nerve-racking life."

Mr. Henry Wood, the Paris representative of the United Press of America, after a visit to the Front, writes:—

"I also visited one of the four aviation camps which protect every depôt. During my visit scarcely a minute passed without armed aeroplanes either returning from or departing for the German front. The air was literally alive with them. . . .

"Equally impressive was a 30-mile horseshoe of French observation 'sausages' overhanging at a great height the entire battle front, wirelessly directing the French fire. Innumerable French aeroplanes darted in and out among the 'sausages,' crossing and recrossing the German lines every minute. But not a single German aeroplane ever appeared either to drive back the French and attack the 'sausage' or to reconnoitre. Nor was a single German 'sausage' visible to offset the 26 French 'sausages' which I was able to count. Nothing could give a more vivid impression of the undisputed French mastery of the air."

A Six-Passenger Height Record.

The *Petit Parisien* reports that the Italian pilot, Antonacci, at Milan, on one of the large Italian military biplanes recently took up six passengers to a height of 5,850 metres (19,912 ft.), thus pretty badly beating the record recently made in France by Poiree of 2,800 metres (9,100 ft.).

An Aeroplane Wireless Record.

Claimed as a record in wireless telegraphy from an aeroplane, Capt. Clarence Culver, of the United States Army Aviation Corps, during a flight from San Diego to Santa Monica, 114 miles away and back, is said to have kept in touch with his station by sending wireless messages every 3 minutes. The power for the transmission set, which was designed by Capt. Culver, is derived from a generator placed on the lower wing section of the aeroplane and driven by a two-bladed propeller. Aerial wires were hung from the *fuselage*, with an insulated counterpoise hung from the wings to the tail of the aeroplane. Complete the set is said to weigh less than 40 lbs.

Sheppey a Military Area.

By an order issued last week, the island of Sheppey, including Sheppey, Queenborough and Sheerness, becomes a special military area on and after September 7th. No person other than those able to prove that they are exempted from the provisions of Regulation 29B will be allowed to enter the area without the permission of the Commandant, whose office is in the Garrison Headquarters at Chatham, and permits will not be available for admission by road or ferry between the hours of 9 p.m. and 5 a.m.

A Camera at the R.A.F.

Charged at Aldershot on August 24th with being in unlawful possession of a camera and taking photographs within a prohibited area, that of the Royal Aircraft Factory, Farnborough, J. N. D. Latouche was remanded.

Opening of the N.S.W. State School.

Speaking at the formal opening of the State flying school at Richmond, N.S.W., on August 28th, Mr. Holman, the Premier, said that funds had been subscribed for presenting five fighting aeroplanes to the Imperial Government, and they hoped to make it half a dozen in a few days. The Government proposed to double these contributions, and within two months it was hoped to have twelve pilots ready to send to England to man the machine. It was expected that the school would turn out a hundred pilots a year. The Governor, Sir Gerald Strickland, said the school was a remarkable example of the keenness and energy of the New South Wales Government to do everything possible to aid the successful prosecution of the war.

During the afternoon, Miss Strickland, daughter of the Governor, and Mr. Holman were taken for flights.

Zeppelins Over Norway.

The *Berlingske Tidende*, on August 28th, published a message from its Bergen correspondent that a number of Zeppelins had been seen from the west coast of Norway, and two passed over Bergen at a great height, travelling from south to north.

Over Holland as Usual.

Ignoring continued protests of the Dutch Government, Zeppelins continue to cruise over Holland whenever it suits their purpose. Last week one of them on its return from England, manœuvred over the capital, while others were reported from different parts of Holland. Commenting on this, the *Nieuws-van-den-Dag* says:—

"These cases of violation of territorial rights threaten to become chronic. Sometimes the nonchalance of these gentlemen surpasses the limit between carelessness and impudence." It adds, ironically: "One must appreciate the fact that they do not accidentally drop bombs on Holland."

A pity there is not a good slice of Dutch-Rumanian courage about just now. It might add still a bit more to the larger half of the civilised world which disagrees materially with German violation of the laws of decent men.

Crocodile Tears from Count Zeppelin.

Count Zeppelin has again been airing his views—this time in the *Deutsche Tageszeitung*. He believes that Germany's superiority in heavy guns, serviceable submarines and Zeppelins will enable her to be victorious against half the world. "If we do not utilise this superiority now," he concluded, "then serious misfortune will befall us." Perhaps, therefore, it's a bit of luck for the rest of the world that Germany's up against more than half of it.

More German "Frightfulness."

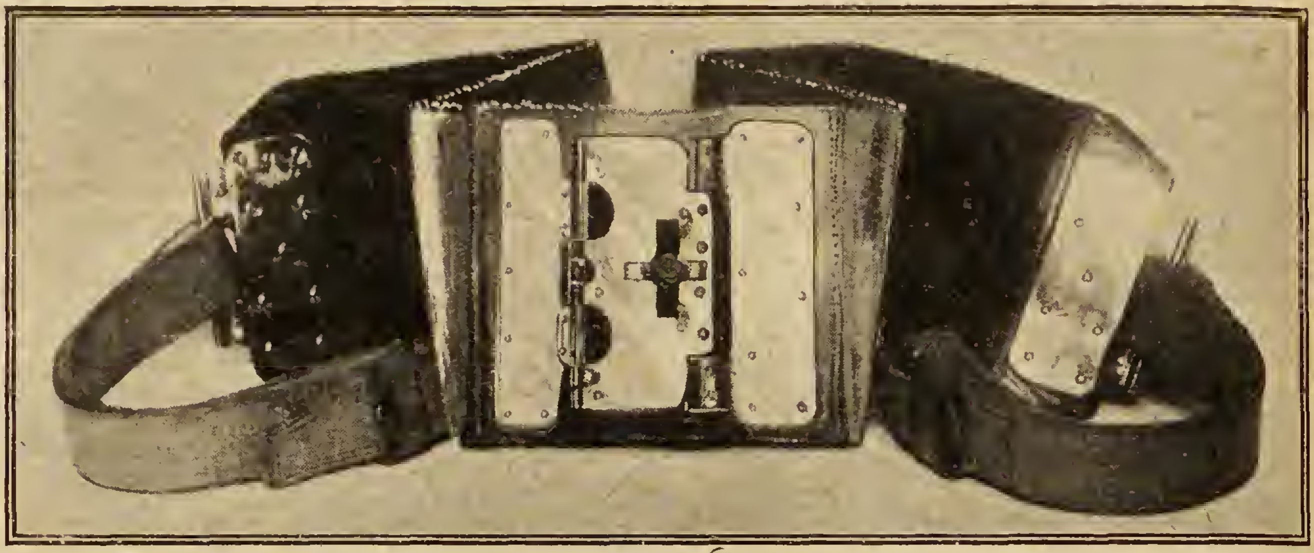
Purely German in idea and execution is the latest German move reported by the Belgian correspondent of the *Journal des Debats*. He states that as a result of a visit of Allied aviators to Brussels the Germans have decided that in future they will place prominent citizens of Brussels, in turn, in the Zeppelin and aeroplane hangars. One day five notable citizens were shut up in the wooden structures, and, in view of the terrible bombardment to which certain parts near Ghent have been submitted, it is not doubted that these measures will be vigorously carried out in future. And then there is talk about trusting to the Huns' honour again some day!

A Zeppelin Reported Damaged.

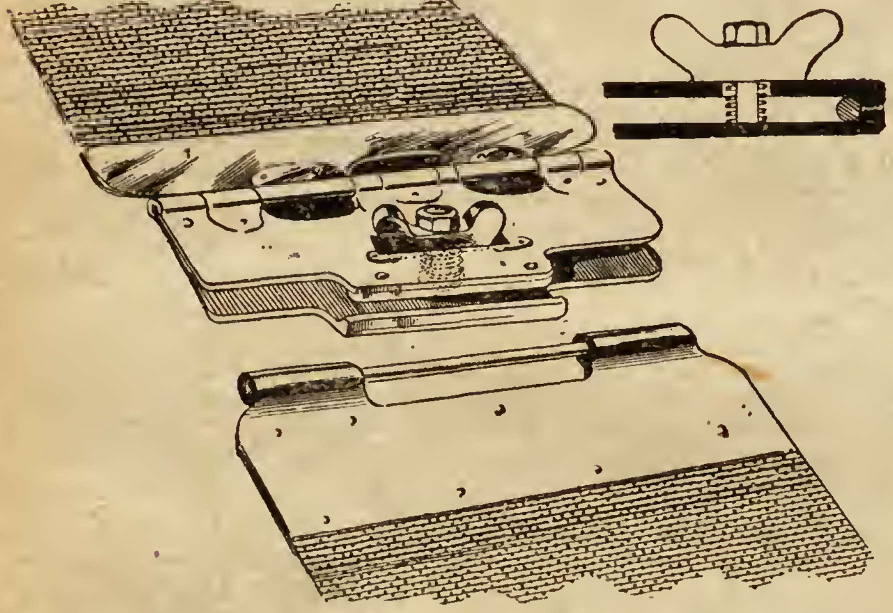
Last week the Dutch frontier guards near Maastricht several times fired on Zeppelins which were cruising over Holland. One airship, it is reported, was so seriously damaged in this way, on August 25th, that it had to descend near Liege.

A New Safety Belt.

APART from the question of reliability, the one essential requirement in a safety belt is that it should have a quick-release catch—a fitting which should really be quick-acting not only in name but in its function. Everything in an emergency may depend on this quick-release catch, and several ingenious devices have been evolved and placed on the market from time to time, but many of them have failed to give thoroughly satisfactory service. One of the latest safety belts to be offered is that manufactured by the Aero Safety Belt Co., of 108, City Road, London, E.C., and of which details are given herewith. Here the quick-release catch fitted is not only extremely simple, but, as far as tests can show, is very reliable and efficient. It is only necessary to look at the accompanying illustrations to see that the method employed in the fashioning of the catch is such that failure to open is next to impossible. The bar, it will be seen, is caught by the jaws, which are held closed together by a cam action when the fly nut is turned at right angles to the slot. To release, it is only necessary to give the nut a quarter-turn so that it is parallel to the slot and the jaws of the clasp will immediately fly open and release the bar.



The "Aero Safety Belt."



Sketch showing the principle of the quick release in the "Aero Safety Belt."

Rivets and Eyelets.

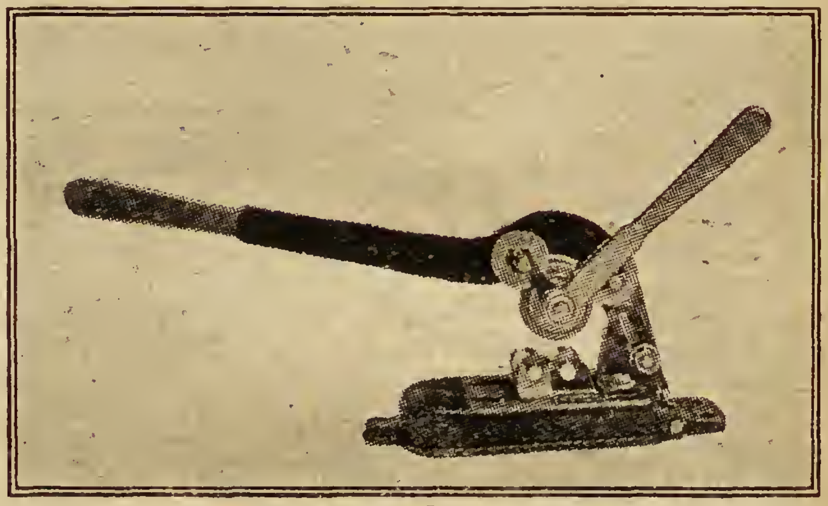
IT is pleasing to note the way in which many makers of accessories and components are realising the tremendous field which is offered them in connection with aircraft. In this connection attention may be drawn to the fact that the Bifurcated and Tubular Rivet Co., Ltd., of Aylesbury, Bucks, who have specialised in rivets, eyelets, staples, tacks, &c., are prepared to supply any of these items for use in aeroplane building. Makers should send for a copy of their list, which shows rivets, either copper or in other metals, in a great variety of shapes and sizes, either bifurcated or solid, while the range of thimbles and eyelets is no less extensive. At the same time they are ready to quote for any fittings which may not appear in their catalogue, and to place their experience at the disposal of any firms who are in the market for goods of this description. The firm's London office is at 235, Upper Thames Street, E.C.

A Gledhill-Brook Telephone Mem.

NOTE should be made of the fact that the telephone number of the London office of the Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W., has just been changed. The call is now 1310 Victoria.

For Stamping Test Marks.

FOR marking metal parts which have passed their inspection tests, the old-fashioned punch is a very unsatisfactory instrument, especially when round parts, such as rods, bolts, &c., have to be dealt with. Up-to-date works managers will, therefore, be interested in a little machine which is marketed by the Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds—an indication that it is well adapted to the requirements of the aircraft industry. It is called the "Young" stamping machine, and by its aid it is possible to mark any metal, tube, pins, bolts, plate, turnbuckles, &c., many of which cannot be stamped with an ordinary punch. Not only is the machine capable of meeting all the demands made in the most varied of inspection departments, but as it only costs £5 5s., it should prove economical as a time-saver, apart from the satisfaction it should give in legible and clear markings.



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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

The Zeppelin Retribution.

MOST assuredly the Zeppelin fleet of 13—ominous number—on Saturday–Sunday night, meant serious business against the hated England. But it was the dog that died, and once again, this time in the sphere of the air, the German has to learn his lesson, that so long as his demoniacal ingenuity devises infernal war methods, so will the British quickly find their antidotes and ultimately turn upon the uncivilised barbarian the same weapons, in an intensified form, by which it has been sought to inflict woe upon us. With one major vessel with its very valuable crew completely annihilated, one more in all probability lost on the homeward journey, and a third badly lamed, the German Higher Command can scarcely honestly cry quits, as against the damage, material and otherwise, which he managed to inflict by means of his entire air-fleet of thirteen. In fact, in spite of all the wonderful fables of the total destruction of the great "fortress of London," the harbours of Harwich, Dover and a few other places they would like to wipe out, besides a few dozen Dreadnoughts, battle-cruisers, &c., which will be issued in due course by the Woolf Bureau to soothe the German public, we fancy the Hun Chancellor of the War Exchequer, or whatever forty-syllable designation may attach in German to that very much worried functionary just now, will find it a pretty tough job to pull his new war loan through, so that there will be much tangible security with which to carry on the financial juggle still a stage further. There is also a further incentive for these attacks to take place now with greater vigour than ever. Hindenburg is a supporter of frightfulness in its most drastic form, and there are indications that before long the German lines may have to be materially shortened in the West, when the military situation would be very greatly altered and the further persistence with these raids upon England would be rendered thereby increasingly difficult of accomplishment with anything like safety. We may, therefore, expect further attempts to break through our cordon of defences in the near future, when fair Luna is once again on the wane and the elements are favourable. That these attacks will become upon every visit more and more hazardous for the invader is certain, and with the taste of "Surprise Packet No. 1" in the mouths of those companion airship crews which got safely away, the chances are that, the next visitation will be even more circumspect than those which we have experienced in the past. In the meantime the well regulated "darkening" of the Metropolis, away to its utmost suburban outer ring, has completely baffled these night hawks, and the Home Defence Authorities are to be congratulated upon their methods in insisting upon the strictest observance of these. Transgressors—fool or the reverse—are being brought to book with promptness and despatch, as they say in business circulars, and obstinate conscientious objectors, in this connection, should receive a more drastic reminder of their duties to their fellow citizens, if they should persist in their obstinacy of holding up the regulations.

As an outcome of the Surprise No. 1 medicine administered by Lieut. Wm. Leefe Robinson, Worcester Regiment, R.F.C., we are glad to welcome the award of the V.C. to this exceedingly gallant officer. Not only did he finish off the pirate craft by deliberate tactics, after having been in the air for over two hours, but he had previously during his flight attacked and helped to drive off another airship. Our sincere congratulations to Lieut. Robinson, V.C., upon his well-merited honour. The problem which has now to be elucidated is as to the identity of the fire-consumed vessel.

◆ ◆ ◆

Zeppelin or Schütte-Lanz.

Without a careful and collated examination of such constructional parts of the airship brought down at Cuffley as had survived the effects of the intense heat of the burning gases, and of the final impact when she struck the ground, it is very difficult to arrive at absolute facts concerning what type of airship it was that came to such a dramatic end on the morning of Sunday last. From the material available, however, much of which is of a contradictory nature, it is possible to make certain deductions, which, without claiming to be exact facts, will probably not be very far wrong.

One of the first peculiarities that impress themselves upon the mind after an examination of the wreckage is the marked scarcity of metal framework and the profusion of wire bracing. This fact can only point to one thing—wood was freely employed in the construction, and rigidity was obtained by means of the wire bracing, much after the fashion of aeroplane construction. As this form of construction was typical of the Schütte-Lanz airships, the theory has been advanced that possibly the craft brought down was of that type. Early in the war, it may be remembered, there were at least two airships built by this firm which figured in reports. One was the S.L. II, which had a length of 470 ft., a diameter of 60 ft., and a cubic capacity of 780,000 cu. ft. She was fitted with four Maybach engines of 180 h.p. each. This ship was severely damaged by the Russians on August 28th, 1914, but the Germans claimed to have successfully repaired her.

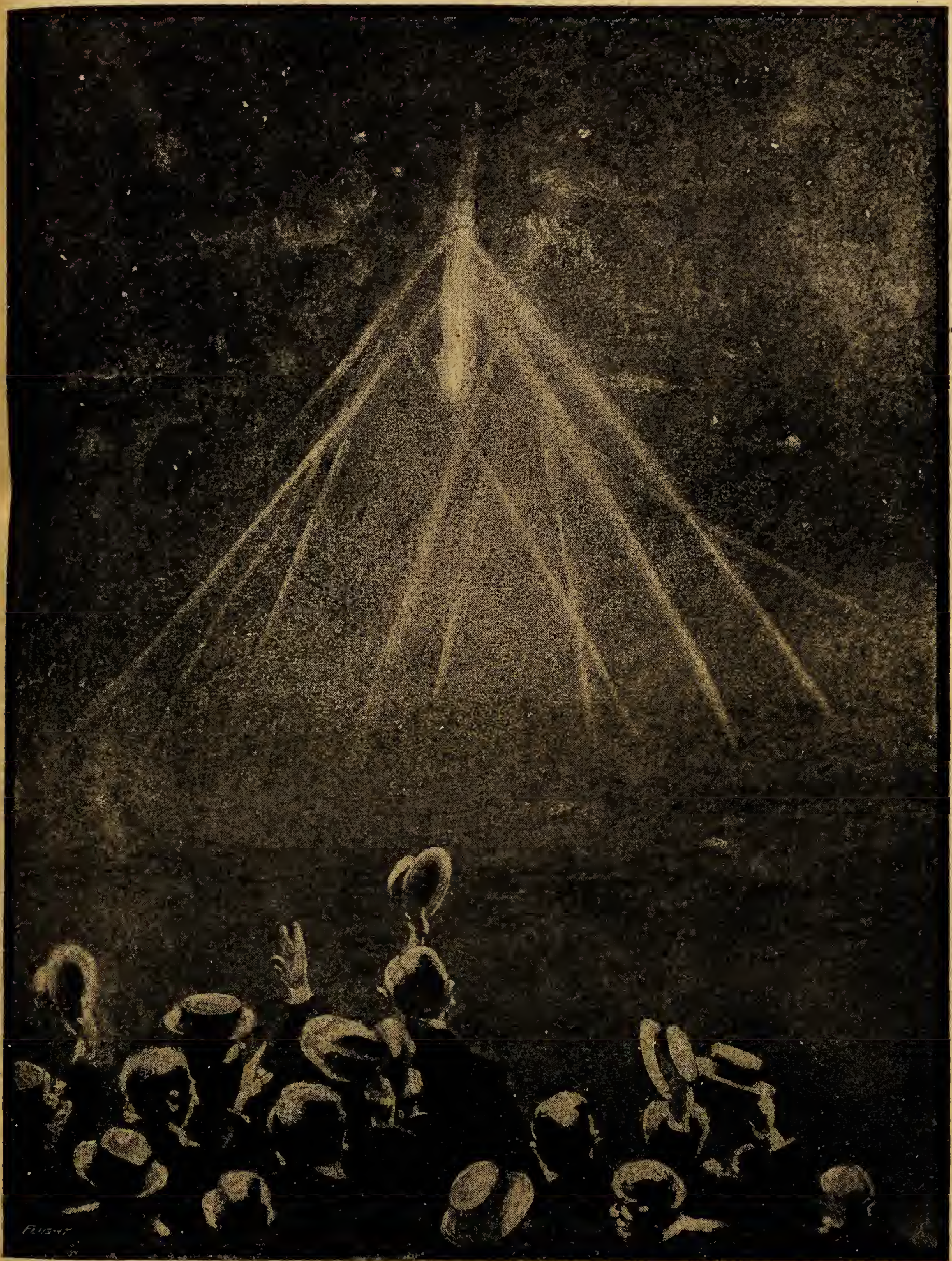
The next Schütte-Lanz to be heard of was S.L. III, which was constructed for the German Navy and bore the naval number L4. This airship had a length of 540 ft., a diameter of 60 ft., and a capacity of 1,065,000 cu. ft. Little was heard of the S.L. III or L4, until she was wrecked off the west coast of Denmark in February, 1915. The engines with which this ship was equipped were four Mercedes motors of 240 h.p. each.

Early in the war, it may be remembered, it was rumoured that no more Schütte-Lanz airships were to be built, and that, as a matter of fact, this firm was building Zeppelins under licence. Whether there was any truth in this rumour, and if so whether this decision on the part of the German authorities was due to actual defects in the S.L. form of construction or to the influence of the financial backers of Count Zeppelin, it is impossible to say. At any rate, if the Cuffley airship was indeed a Schütte-Lanz, she could scarcely have been an old one, as the ships built by this firm up to the beginning of the war have been accounted for with the exception of S.L. II, which would hardly be suitable for long-distance cruises two years after being badly damaged. As far as we can gather, the four engines taken out of the wreck were not Mercedes engines, those who have inspected them being most emphatic on the point that there was no overhead valve gear as in the case of the Mercedes. The engines, we are told, had six cylinders, were of the vertical type, and were painted black, with the exception of a "bright plate" on the top of each cylinder.

This description, vague as it is, appears to tally with the appearance of the 180 h.p. Maybach engines, so that it is reasonable to assume that the airship was fitted with four six-cylinder Maybach engines of 180 h.p. each. As the latest Schütte-Lanz of which we have any definite knowledge, the L4, had four Mercedes engines of 240 h.p. each, it would appear probable that if the S.L. firm were still building for the Germany Navy they would be building large airships with powerful motors, and that therefore these craft would still be equipped with Mercedes engines.

Another fact which rather tends to strengthen the theory that the airship was not a Schütte-Lanz is that the Zeppelin firm have always favoured the Maybach engines. The probabilities would, therefore, seem to be that the airship was a Zeppelin, and it now remains to determine whether she was of the old type or one of the later models. Although eye-witnesses do not agree on the point of whether she was straight-sided or of stream-line form, some being of the opinion that she was one shape, others maintaining that she was the other, it is more than probable, in view of the fact that wood was so extensively employed in her construction, that she was of the modern, or stream-line, form. In the first place, the metal framework construction was so typical of the earlier straight-sided Zeppelins, that it does not seem probable that when going to such radical alterations as to substitute wood for metal in the main construction the older and aerodynamically inefficient form would be retained, especially as the wood can be employed with greater advantage in the curved than in the straight-beam form.

Everything, therefore, appears to point to the



THE ZEPP. HOLOCAUST.—The final stage of the doomed airship, as seen from Hampstead Heath.

probability that in the modern Zeppelins some of the constructional features of the Schütte-Lanz have been incorporated, when the necessity for speed rendered a stream-line form of hull advisable. In the official report of the bringing down of the airship it was stated that the employment of wood might indicate a scarcity of aluminium in Germany. With this we can hardly agree, in view of the fact that Germany has inside her boundaries vast resources of the aluminium ore from which the metal is produced. The duralumin used in the construction of the German airships does not, of course, consist of pure aluminium, but is an alloy of which the chief constituent in addition to the aluminium is magnesium, which forms the hardening agent. Also of this there is every reason to suppose that Germany possesses ample raw material. The reasons for substituting wood for the duralumin are, therefore, hardly to be sought for in any scarcity of raw material for the manufacture of the metal, but must be attributed to advantages which the wood has been found to possess for construction of stream-line structures.

One of the chief troubles experienced with the duralumin construction was, we believe, that the rivets joining the various component parts of the framework were in the habit of shearing under the effects of the vibration from the engines and other stresses to which such a large structure is subjected.

This departure in constructional methods might be kept in mind by our own designers, and the lesson thus learned taken advantage of when building rigid airships.

V.C. for Lieut. W. L. Robinson, R.F.C.

THE following appeared in the *London Gazette* of the 5th inst. :—

" H.M. the King has been graciously pleased to award the V.C. to the under-mentioned officer :—

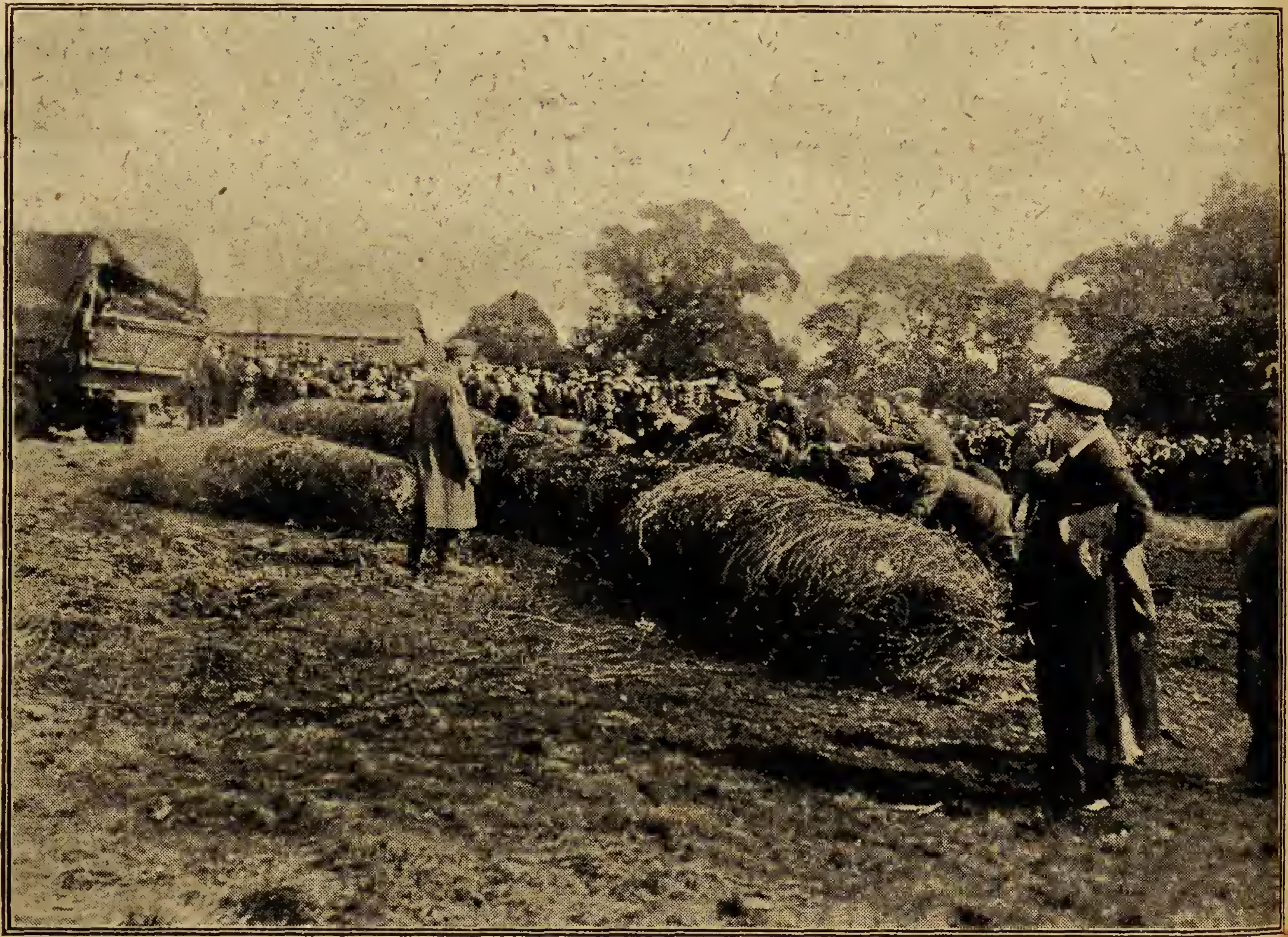
"Lieut. Wm. Leefe Robinson (Worcester Regt. and R.F.C.). For most conspicuous bravery.

" He attacked an enemy airship under circumstances of great difficulty and danger, and sent it crashing to the ground as a flaming wreck.

" He had been in the air for more than two hours, and had previously attacked another airship during his flight."

Born at Tellidetta, South Coorg, South India, Lieut. William Leefe Robinson was 21 on July 14th last. He is a son of Mr. Horace Robinson and a grandson of Mr. W. C. Robinson, R.N., Chief Naval Constructor at Portsmouth Dockyard. He came to England when six months old and returned to India when he was seven. At fourteen he came back again, and went to St. Bee's School, Cumberland. After travelling in France for some time, he entered Sandhurst in August, 1914, and on December 16th of that year was gazetted to the Worcestershire Regiment. Later he joined the Royal Flying Corps, and was in France as an observer from February last until on May 9th he was wounded in the right arm by shrapnel whilst flying over Lille. He came back to England, and, after convalescence, began training as a pilot, taking his certificate on July 28th, 1915. Subsequently he was trained as a night pilot, and was up on all the raids near London for the last seven months. Lieut. Robinson's only surviving brother is at present in Mesopotamia.

[Just as "FLIGHT" is on the Press it is announced that the airship brought down was "L. 21."]



THE ZEPP. HOLOCAUST.—R.F.C. men collecting the wire—*some* wire—of the destroyed airship at Cuffley. On the left is a motor lurry with a load of other "relics" of the monster dirigible, and beyond the lurry is seen the little chapel where the mortal remains of the airship's crew found temporary sanctuary.

The British Air Services

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared among the Admiralty announcements of August 30th :—

Probationary Flight Sub-Lieutenant (Temporary).—M. C. Redford granted a temporary commission as Sub-Lieutenant (R.N.V.R.), seniority Aug. 29th, and appointed to "President," additional, for R.N.A.S. (appointment as Probationary Flight Sub-Lieutenant terminated) ; Aug. 28th.

The following appeared among the Admiralty announcements of September 1st :—

The under-mentioned have been entered as Probationary Flight Sub-Lieutenants for temporary service, and appointed to the "President," additional, for R.N.A.S., all to date Sept. 3rd : H. E. Hyde, D. H. F. McMaster, V. F. A. Galwayne, L. E. Adlam, J. W. McCann, C. F. D. Ash, E. G. Harwood and J. H. Thompson.

The following appeared among the Admiralty announcements of September 2nd :—

W. Allaway entered as Probationary Flight Sub-Lieutenant for temporary service, and appointed to "President," additional for R.N.A.S., to date Sept. 10th.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of August 29th :—

Equipment Officer.—Second Lieut. W. W. Hart, and to be Temporary Captain whilst so employed ; June 21st, 1916.

Suptg. Clerk David McBirney, from R.A., to be Qr.-Mr. with the hon. rank of Lieutenant ; June 15th, 1916.

Memoranda.—To be Temporary Second Lieutenants for duty with R.F.C. :—July 31st, 1916 : 1st Class Air-Mechanic W. H. Gouldstone, from R.N.A.S. ; Petty Officer W. H. Rose, from R.N.A.S. Sergt. P. P. Capelli, from A.S.C. ; Aug. 2nd, 1916. Pte. R. Richards, from Princess Patricia's Canadian L.I. ; Aug. 12th, 1916. Aug. 16th, 1916 : Pte. N. D. Robinson, from Inns of Court O.T.C. ; Gunner E. D. Warburton, from New Zealand Force ; Sergt. A. S. Talbot, from Australian Imperial Force ; Pte. C. Russell Bray, from Australian Imperial Force. Sergt. G. M. Eiloart, from Harrow Sch. O.T.C. ; Aug. 17th, 1916. Pte. C. T. Warman, from A.S.C. ; Aug. 18th, 1916.

To be Temporary Second Lieutenants (on probation), for duty with R.F.C. :—Aug. 5th, 1916 : C. M. Bailey, D. C. Beadell, J. W. Cairns, E. H. Comber-Taylor, W. O. Cornish, F. J. Cowlishaw, D. Dalgleish, R. N. Dobbyn, J. FitzHugh, V. J. Hammon, G. A. D. Hancock, J. S. Harrison, M. Liggett, O. W. A. Manning, G. H. Martingell, A. W. Mason, H. Morris, S. Orchard, R. A. Phipps, H. H. T. Potter, G. J. E. Smith, W. A. Southey, A. Watson, G. T. Wix, G. R. Dawbarn, P. A. de Escofet, L. I. Eskell, B. B. Henry, J. Lawson, L. H. Leckie, L. G. Lovell, W. A. McClatchie, M. A. Kay, A. Pascoe, E. L. Prichard-Evans, H. Smither, G. O. Venn, D. P. Walter, V. W. Allen, R. Hopper, V. Phillips, G. D. Smith, F. A. Taylor, H. J. Ball, T. H. French, G. W. Shuter, A. D. Taylor, M. Topham, R. Anderson, W. J. G. Armiger, H. Blythe, T. E. Pennington, R. F. Barnes, A. Bell-Irving, M. B. Cole, J. H. Dale, J. W. Eyton-Lloyd, C. J. Howson, H. F. Lindo, M. A. McKenzie, R. B. Sisson, H. Cresswell, A. G. Cribb, M. L. J. Daly, J. Harper, J. L. Hill, E. S. Moore, W. C. Bagnall, R. M. Burnand, E. T. Carpenter, G. Cowpe, W. A. J. Gribble, J. G. Goodyear, W. E. Goodyear, C. H. Harriman, A. J. Lucas, C. S. Richmond, M. E. Woods, T. C. Arnot, T. M. Chapman, W. Harris, L. G. Harrison, S. J. Stewart, G. G. Thomson, N. E. Barraclough, F. Berryman, B. G. King, H. P. Rushforth, R. Temple, A. W. Watson, C. J. Agelasto, L. W. Beal, E. C. Black-Roberts, J. R. Cudemore, V. F. S. Dunton, T. Durrant, P. F. Fullard, C. L. Gunnery, E. Hillary, S. C. Lumb, H. E. F. Russell and R. C. Savery.

Supplementary to Regular Corps.—Lieutenants to be Captains : H. Le Jeune and L. T. G. Mansell ; July 1st, 1916.

To be Captains :—Aug. 1st, 1916 : Lieutenants (Temporary Captains) R. G. Gould, F. Jolly, L. F. R. Fell and A. M. Morison ; Lieutenant (Temporary Major) C. Defries ; Lieutenants (Temporary Captains) W. D. S. Sanday, A. B. Adams, P. E. L. Gethin and G. H. B. McCall ; and Lieut. E. S. Skipper.

The following appeared in a supplement to the *London Gazette* issued on August 30th :—

Flight-Commander.—Second Lieut. (Temporary Lieut.) G. N. Martin, Durh. L.I., Special Reserve, from a Flying Officer, and to be Temporary Captain whilst so employed ; Aug. 13th, 1916.

Equipment Officer.—Temporary Capt. A. H. S. MacCallum, General List ; Aug. 8th, 1916.

Flying Officers.—Temporary Second Lieut. J. B. Davies, N. Staff R., and to be transferred to the General List ; Aug. 1st, 1916. Aug. 3rd, 1916 : Second Lieut. F. E. Hills, R.G.A. (T.F.) ; Second Lieut. (on probation) L. J. Riordan, R.F.A., Special Reserve. Aug. 4th, 1916 : Temporary Second Lieut. (Temporary Lieut.) V. G. A. Bush, General List, from a Flying Officer (Observer). Temporary Second Lieut. W. H. Miles, R.E., and to be transferred to the General List. Second Lieut. V. F. Stewart, Durh. L.I. (T.F.). Temporary Second Lieut. P. R. Mallinson, Bedf. R., and to be transferred to the General List. Second Lieutenants, Special Reserve : D. J. Taylor, J. M. Batting, R. P. C. Freemantle. Aug. 5th, 1916 : Lieut. (Temporary Capt.) A. G. H. Carr, York and Lanc. R. (T.F.) ; Second Lieut. T. Q. Back, R.F.A. (T.F.). Second Lieut. E. L. Ives, W. York. R., Special Reserve, and to be seconded ; Aug. 7th, 1916. Aug. 8th, 1916 : Lieut. P. M. L. Edmunds, 12th Lcrs., and to be seconded ; Second Lieut. (Temporary Lieut.) W. Morrice, Queen's Own R. Glasgow Yeo. (T.F.) ; Temporary Second Lieut. H. Lambourne, Notts and Derby R., and to be transferred to the General List ; Second Lieut. F. W. Morter, R. War. R., Special Reserve, and to be seconded. Second Lieut. (Temporary Lieut.) F. T. Woods, North'n R. (T.F.) ; Aug. 9th, 1916. Aug. 10th, 1916 : Temporary Lieut. R. D. S. Sparkes, Welsh R., and to be transferred to the General List ; Temporary Lieut. D. H. Bacon, A.S.C., and to be transferred to the General List ; Second Lieut. K. F. Hunt, Sco. Horse Yeo. (T.F.). Second Lieut. J. L. Robertson, York. R. (T.F.) ; Aug. 11th, 1916.

Flying Officers (Observers).—Aug. 6th, 1916 : Capt. H. P. D. Helm, Bord. R., Special Reserve, and to be seconded ; Temporary Second Lieut. C. W. T. Riley, General List. Aug. 14th, 1916 : Temporary Capt. R. E. Saul, A.S.C., and to be transferred to the General List ; Temporary Second Lieut. L. Taylor, General List ; Temporary Second Lieut. L. C. Chapman, General List.

Balloon Officers.—Temporary Second Lieut. W. Sutherland, Midd'x R., and to be transferred to the General List ; Aug. 5th, 1916. Aug. 6th, 1916 : Temporary Second Lieut. G. A. Sinclair-Hill, Midd'x R., and to be transferred to the General List ; Temporary Second Lieut. H. E. Ambrose, R. Fus., and to be transferred to the General List ; Second Lieut. R. Hofmeyr, Yorks. L.I., and to be seconded ; Second Lieut. W. Y. Walls, Arg. and Suth'd Highrs. (T.F.) ; Temporary Second Lieut. L. A. C. Helbert, General List ; Second Lieut. J. A. Cochrane, R. Sc. Fus. (T.F.) ; Second Lieut. A. M. Pearson, Special Reserve ; Temporary Second Lieut. R. D. Bradshaw, General List ; Second Lieut. A. W. Crombie, Special Reserve. Temporary Lieut. P. H. Corbett, 9th Lcrs., from 7th Res. Regt. of Cav. ; Aug. 10th, 1916.

Assistant Equipment Officers.—July 1st, 1916 : Second Lieutenants, Special Reserve : T. G. Leith, R. G. Booth, J. W. G. Mackinlay. Temporary Lieut. B. J. Wolfe-Barry, R.A., and to be transferred to the General List ; July 17th, 1916. Aug. 1st, 1916 : Second Lieutenants, Special Reserve : A. O. Betts, C. H. Drabble. Aug. 14th, 1916 : Second Lieut. N. A. Grandage, R.E. (T.F.), Second Lieut. F. E. Bray, Special Reserve ; Temporary Second Lieut. A. W. Smith, General List ; Temporary Second Lieut. W. B. South, General List ; Temporary Second Lieut. W. Hammond, General List ; Second Lieutenants, Special Reserve : R. J. Copley, C. Woodall, G. Craig, J. O. Ruscoe ; Temporary Second

Lieut. A. G. T. Applin, General List; Second Lieutenants, Special Reserve: H. Loeffler, W. F. C. Nason, R. E. Reid, J. R. G. Rowden, J. M. Scott, A. T. Shaw, E. F. Sutton, G. F. Wilson and W. B. Brett.

Memoranda.—Lieut. A. H. S. MacCallum, from R.N.V.R., to be Temporary Captain for duty with R.F.C.; Aug. 8th, 1916.

To be Temporary Second Lieutenants for duty with R.F.C.: Cadet W. F. Merritt, from Camb. Univ. O.T.C.; Aug. 5th, 1916. L.-Corpl. O. Matson, from Canadian Ex. Force, and Pte. A. W. Erlebach, from Inns of Court O.T.C.; Aug. 14th, 1916. Sergt. M. G. Cole, from Marlborough Coll. O.T.C., and Dvr. D. P. Collis, from Canadian Ex. Force; Aug. 15th, 1916. Pte. J. Ferguson, from Winchester Coll. O.T.C.; Pte. H. C. Bourne, from Australian Imperial Force; and Gunner C. B. King, from Australian Imperial Force; Aug. 16th, 1916. Dvrs. T. H. Lines and E. G. Roberts, from H.A.C. (T.F.); Aug. 18th, 1916.

2nd Class Air-Mechanic H. W. Carter, from R.F.C., to be Temporary Second Lieutenant for duty with the Military Wing of that Corps; Aug. 17th, 1916.

Supplementary to Regular Corps.—The appointment as Second Lieutenant of R. Stubbs, notified in the *Gazette* of July 17th, 1916, is cancelled.

Second Lieutenants (on probation) confirmed in their rank: A. O. Betts, R. G. Booth, C. H. Drabble, F. E. Bray, D. J. Taylor, J. W. G. Mackinlay, R. J. Copley, C. Woodall, J. M. Batting, A. W. Crombie, A. M. Pearson, D. H. Glasson, J. Fairbairn, E. J. Henderson, H. J. Gibson, G. F. Wilson, J. M. Scott, J. O. Ruscoe, J. R. G. Rowden, R. E. Reid, E. F. Sutton, W. F. C. Nason, A. Young, A. B. Albert, E. McM. Howes and H. Darnell.

To be Second Lieutenants (on probation): A. S. Cox; Aug. 2nd, 1916. Aug. 3rd, 1916: D. W. Wilson, A. W. Payne. Aug. 5th, 1916: J. N. Stephens, T. G. Mackenzie, L. G. P. Warren. Aug. 11th, 1916: E. L. Pape, C. McM. Russell. Aug. 14th, 1916: D. Alexander, H. E. Duncan. G. F. P. Warren; Aug. 15th, 1916. Aug. 16th, 1916: V. Andrew, A. B. Morgan. Aug. 18th, 1916: H. P. Reid, F. A. Smith. D. L. Daly; Aug. 26th, 1916.

The following appeared in the *London Gazette* issued on September 1st:—

Flight-Commanders.—Aug. 8th, 1916: Capt. H. M. Meyler, Bord. R., from a Balloon Officer; Lieut. D. C. L. Speed, K.R.R.C., from a Balloon Officer, and to be Temporary Captain whilst so employed. Second Lieut. (Temporary Lieut.) D. M. Tidmarsh, R. Ir. Regt., Special Reserve, from a Flying Officer, and to be Temporary Captain whilst so employed; Aug. 16th, 1916.

Flying Officer (Observer).—Temporary Second Lieut. S. F. P. Polhill, R.E., and to be transferred to General List; Aug. 16th, 1916.

Memorandum.—The under-mentioned to be Temporary Second Lieutenant: L.-Corpl. J. L. Dearing, from A. Ord. Corps, for duty with R.F.C.; Aug. 26th, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 2nd:—

The under-mentioned Warrant Officers to be Second Lieutenants for service in the Field:—S. Lan. R.: Sergt.-Major J. Kemper, from R.F.C., and to be seconded for duty with the R.F.C.; Aug. 1st, 1916.

Sea. Highrs.: Sergt.-Major J. McCrae, from R.F.C., and to be seconded for duty with R.F.C.; Aug. 2nd, 1916.

The under-mentioned Warrant Officers, N.C.Os. and men to be Temporary Second Lieutenants (on probation):—

For duty with R.F.C.: Corpl. M. P. Mullery, from R.F.C.; July 12th, 1916. Aug. 2nd, 1916: Sergt. T. S. L. Mann, from R.F.C.; Bombr. W. E. Cass, from R. Can. H.A.; L.-Corpl. A. Kock, from Alberta Dns.; Aug. 3rd, 1916. Aug. 4th, 1916: Flight-Sergt. J. B. Waddoup, from R.F.C.; Sergt. R. J. Muxworthy, from R.F.C.; 1st Class Air-Mechanic B. Pool, from R.F.C.; 1st Class Air-Mechanic H. S. Wilkins, from R.F.C.; 1st Class Air-Mechanic N. Glover, from R.F.C.; 1st Class Air-Mechanic L. Norris, from R.F.C.; Pte. F. Libby, from Can. Ord. Corps; Dr. W. M. V. Cotton, from Can. A.S.C.

Memorandum.—Second Lieut. (on probation) E. J. Pascoe, from Lan. Fus., Special Reserve, to be Temporary Second Lieutenant (on probation) for duty with R.F.C.; Sept. 3rd, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 4th:—

Park Commanders.—From Equipment Officers, and to be Temporary Majors whilst so employed:—Aug. 1st, 1916: Second Lieut. (Temporary Capt.) M. D. Methven, Lond. R. (T.F.); Second Lieut. (Temporary Capt.) H. Lee, Special Reserve.

Equipment Officers.—From Assistant Equipment Officers:—Aug. 1st, 1916: Temporary Capt. W. Wade, General List; Temporary Capt. E. A. Goodwin, General List. From Assistant Equipment Officers, and to be Temporary Captains whilst so employed: Second Lieutenants, Special Reserve: H. P. Boot, T. Worswick, A. F. Palmer, E. Bush; Aug. 21st, 1916.

Flying Officers.—Aug. 4th, 1916: Temporary Lieut. A. P. Maurice, A.S.C., and to be transferred to the General List; Second Lieut. H. Slingsby, Special Reserve; Second Lieut. F. H. Bowyer, R. W. Surr. R., and to be seconded. Aug. 6th, 1916: Lieut. L. R. Briggs, Lond. R. (T.F.), from a Balloon Officer; Second Lieut. L. V. Drake, Denbigh Yeo. (T.F.); Temporary Second Lieut. W. G. Barlow, General List. Aug. 7th, 1916: Second Lieut. A. D. Pocock, Special Reserve; Second Lieut. L. L. M. Evans, Special Reserve. Temporary Second Lieut. C. H. M. King, General List, from a Flying Officer (Observer); Aug. 8th, 1916. Aug. 10th, 1916: Second Lieut. (Temporary Capt.) J. M. Robb, North'd Fus. (T.F.); Temporary Second Lieut. D. H. Manwaring, R. W. Kent R., and to be transferred to the General List.

Adjutant.—Lieut. R. Whitaker, Rif. Brig., from a Flying Officer (Observer), vice Major M. Freeman, Worc. R., Special Reserve; June 7th, 1916.

Memorandum.—2nd Class Air-Mechanic F. C. Zink, from R.F.C., to be Temporary Second Lieutenant for duty with the Military Wing of that Corps; Aug. 17th, 1916.

Supplementary to Regular Corps.—Second Lieut. R. H. Lane relinquishes his commission on appointment to the Canadian Expeditionary Force; June 17th, 1916.

Second Lieut. (on probation) H. C. Eltringham resigns his commission; Sept. 5th, 1916.

Aeronautical Inspection Department.

THE following appeared in a supplement to the *London Gazette* issued on August 30th:—

Second Lieut. L. F. Bennett, R.F.C., Special Reserve, to be Temporary Honorary Lieutenant, General List, whilst employed as Assistant Inspector, Aeronautical Inspection Department; July 15th, 1916.

The following appeared in the *London Gazette* of September 1st:—

Temporary Second Lieut. S. G. Young, General List, to be Temporary Honorary Lieutenant (without pay and allowances) whilst employed as an Assistant Inspector, Aeronautical Inspection Department; Sept. 1st, 1916. The under-mentioned to be Temporary Honorary Lieutenants on the General List (without pay and allowances) whilst employed as Assistant Inspectors, Aeronautical Inspection Department. Sept. 1st, 1916: Second Lieut. J. E. Appleyard, R.F.C., Special Reserve; Second Lieut. E. A. Salt, R.F.C., Special Reserve.

The following appeared in a supplement to the *London Gazette* issued on September 2nd:—

Temporary Second Lieut. A. B. D. Lang, General List, to be Temporary Honorary Lieutenant (without pay and allowances) whilst employed as an Assistant Inspector, Aeronautical Inspection Department; Sept. 1st, 1916.

Looping by Night Over Tokyo.

PRACTICALLY the whole of the two million population of Tokyo, Japan, turned out on the night of June 5th to see a looping demonstration by Art. Smith, an American pilot. He went up from the Aoyama ground at 8 p.m., his machine showing one green and two red lights. At 2,000 ft. he switched off the lights, and after climbing 1,500 ft. in the dark he switched on a row of electric lights along his machine. He then made 13 loops, and landed safely at Aoyama. Early in the day, by permission of the Emperor, he had flown over the Imperial Palace.

The Zepp: Holocaust.

By an Eye-Witness.

Of course, you have read all about the Zepp. raid in the early hours of last Sunday; everybody has. You have read of the wonderful things that she did, wonderful even for a Zepp. How she "wriggled" like an eel to escape the gun fire. How she stood absolutely vertical to climb. How she was seen to shiver as the shots got home, and all the rest of it. As I happened to see this particular airship from the moment the searchlights picked her up until she fell a flaming mass behind the trees, and as I happen to be engaged in aeronautics, perhaps one account more will make interesting reading, and possibly contain information as nearly correct as one with a knowledge of aviation can make it. I will tell of it exactly as I saw it.

I live in a district exactly in the path of the Zepps., when they steer a true course, I know within a little where to look for them, and I have seen every one that has visited the London area. On Saturday night, as early as ten-thirty the "raid feeling" was in the air. It was pitch dark. All the station lights were out, and six or eight searchlights persistently wavered round and round one little spot in the eastern sky. It was a night to sit up and read. Every half hour or so I went out to have a look round. Everything was very quiet with that breathless, expectant quietness heralding a coming storm. Once—it must have been about one o'clock—a blue fireball cut straight down through the air almost over my head, to burn out two hundred feet up. Still not a sound to be heard. At five minutes past two the air vibrated to the beat of distant engines. The searchlights roved the sky in scores. Suddenly, not to the east, but to the west, a light flickered for a moment on a long bright body, and instantly there she was, at least twelve thousand feet up, sailing due north, the centre of attraction for the whole outfit of lights.

In a moment the air was filled with the crash of guns, and shells screamed their passage towards their target. Slowly the airship turned on her course, and, steering due east, made directly for my overhead. When almost above me she turned her nose to the north-east, but drifted due north. She moved very slowly, "crabbing" all the while, and I am pretty certain that her engines were not working, that she was temporarily disabled and drifting with the wind. I saw her quite plainly, end view and broadside on, and I give it as my opinion that she was a Schütte-Lanz, and that the shape of the envelope was very similar to the army S.L. 1 of 1909.

The "crabbing" north lasted for, I should say, five minutes, and then she appeared to get under power again and wore her nose round until she was steering almost due west, making back towards London, but some ten miles further north. Guns were pounding at her incessantly, and from my point of vantage the shells appeared to burst all over her: under and over and at both ends. Suddenly "something" happened, when every gun ceased firing as if by magic, and in the full blaze of the searchlights she sailed ahead. It was an ominous silence that seemed to tell of something *else* about to happen.

A little flicker of flame appeared at her nose, died down, and then burst into a bright light for about a fifth of her length. It lit the sky with a brilliant light that got more powerful as the flames ran along the envelope to the entire length. For a few moments I saw her full outline as a burning mass, during which time she continued to travel forward. Slowly, very slowly she dipped her nose, forming a graceful curve, and then stood end up. This was when, as the flames roared up from the front and joined with those farther back, apparently opening the entire envelope and liberating huge quantities of gas, the brightest light was shown.

Where I stood, ten miles away, it lit up the streets and woods until one could imagine it a glorious rosy sunset, for the flames were principally of a crimson colour. It is difficult to guess time under such circumstances, and watches unthought of with such a display in progress, but I should estimate the time from the moment she was hit until the final crash, which I distinctly heard, like unto plunging hot iron into water, as being three to four minutes.

The slow speed at which she fell was amazing to me. I had expected, once she got nose down, to see her move at a terrific pace. But the mammoth appeared to be a huge mass of flame supported by a parachute. When yet some five thousand feet up, the light, especially at the lower end, turned to a brilliant ruby, lightening away through crimson and pink to an incandescent white at the top, the following flames, above, being pale yellow. Just at that moment there was a crackling as of exploding ammunition, or it might have been from the twisting of the girders, or the breaking of timber. Then she disappeared behind the trees with a crash, and a final flare flashed up. I need not mention the cheers, they echoed throughout the whole of London, but in the district where I stood, we had another burst all on our own, as three coloured lights sprang into being and hung motionless in the sky, for we knew them for the guiding lights for the returning victorious airman or airmen.

Such is the story, given exactly as I saw it. As to time, I should judge the whole period during which she was under my notice as about fifteen minutes.

ZEPPELINISMS.

Three Iron Crosses were picked up in the wreckage, and one of them, together with a revolver, passed into the possession of Lieut. Robinson. A gold cross was also found.

The storekeeper at Hill Farm Cottage, near where the Zeppelin fell, was not disturbed in his sleep by the crash.

One of the propellers fell a couple of hundred yards away from the main wreckage, just missing a small church on the edge of the field.

The charred remains of the 16 victims were placed in this small mission church at Cuffley, being accorded a funeral at Potters Bar of a military character, attended by a detachment of the R.F.C., on Wednesday. Let us hope this will be interpreted at its true value as being an honourable tribute individually to men who, under superior orders, were doing what was necessarily their duty; not as an indication that we, in any shape or form, approve the form of warfare to which the Germans have illegitimately devoted their airships. In fact, quite the contrary.

An inquest was held on Monday evening to inquire as to who 16 men of the crew of the wrecked airship L 21 met their deaths, and the jury's findings were: (1) That on September 3rd 16 unknown German airmen were found dead in a wrecked Zeppelin airship. (2) That this airship was brought down by a British aeroplane, piloted by Lieut. Robinson. (3) That the cause of their death was injuries, the result of the destruction of the Zeppelin.

A clock was found intact among the wreckage. The hands indicated that it had stopped at ten minutes past three. Was this by Berlin time, sun time or British clock time?

Four six-cylinder engines were found among the wreckage.

When it was possible to approach the wreck the body of an officer was found with his left hand on a steering wheel, but his right hand had been torn away.

The glare of the conflagration when the airship turned into a vertical position was seen at Southend, 37 miles away.

People living near expected to hear a great crash when the wreck struck the ground, but one who was near states there was little noise beyond the crackling of the burning wood and the explosion of small-arm ammunition.

A contingent on the way to the scene where the raider "alighted."

Pieces of the fallen Zepp. as souvenirs appear to be more numerous than authentic, though many are genuine enough. A soldier is said to have sold a button from a German uniform for 5s., and a fire-marked mark fetched the same price. This is the highest mark the mark has reached since the war started. Quite high-water mark.

The amount of wire found in the fallen airship is astounding, as is also the fact that it lived through the intense heat without reaching the melting point. A suggestion put forward is that this wire should be given to the Red Cross Society to be cut into short strips and sold, mounted on little cards, as relics of the first German Zeppelin brought down on English soil, as most of the many million people who saw that Zeppelin ablaze over London would buy a bit, and the Red Cross Society might be much the richer.

It is said that the track of the vessel after it was fired is easily traced by the exploded small-arms ammunition, all the brass cases of which have split with the explosion.

The airship brought down was not the only one to receive a hot reception, and at about the same time, according to a correspondent.

He informs us that after the wrecked airship had disappeared in a mass of flames, he saw another one which appeared to be in difficulty.

On one occasion, our correspondent says, she stood on her tail as if about to give a demonstration of what a Zepp. is capable of in the way of climbing, only she reminded him of a man taking a running leap at a ditch, his feet slipping at the last moment and he landing in the middle of the ditch.

Apparently her engines forsook her at the critical moment, for she merely struck the dramatic attitude, without, however, seeming to get on with the climbing.

Soon afterwards she appeared to be hit, and drifted rather than cruised into the clouds.

Part of a gondola with its supporting wires and other apparatus has been found in an East Anglian coast village.

A petrol tank, apparently jettisoned from one of the returning airships, has also been found in East Anglia.

Some of the raiders on their way home attempted to bomb vessels in the North Sea—it was a pity to waste them or carry them home—but in no case was damage caused.

Fishermen who returned to Esbjerg on Monday night reported that on Sunday forenoon outside the territorial water limit off the Sylt they saw five Zeppelins going in an easterly direction. At 11 o'clock another Zeppelin appeared, going very slowly. The crew was engaged throwing articles overboard in order to keep the airship out of the sea. The Zeppelin, which was severely damaged, is supposed to have fallen on the water between the Sylt and the Schleswig coast.

THE "X" AIRCRAFT RAIDS.

"X 46" Raid, September 2nd and 3rd.

The following official *communiqués* have been issued by the Field-Marshal Commanding-in-Chief Home Forces :—

September 3rd, 12.10 *a.m.*

"Shortly before 11 p.m. our Eastern Counties were attacked by several hostile airships. Bombs have already been dropped at a few places, but no details are yet to hand to show how many raiders are engaged and what their objectives may be. The raid is still in progress. A further *communiqué* will follow."

3.45 *a.m.*

"The attack to-night was made by a larger number of airships than have ever previously raided England. The Eastern Counties and London were apparently their objectives. The attack on London was beaten off, and one raider was brought down in flames. Many bombs were dropped in widely separated localities, but no reports of casualties or damage have yet been received."

1.35 *p.m.*

"Last night's raid was carried out by 13 airships, and was thus the most formidable attack which has been made on this country. The principal theatre of operations was the Eastern Counties, and the objectives seem to have been London and certain industrial centres in the Midlands. The new measures taken for the reduction or obscuration of lights undoubtedly proved most efficacious, for the raiding squadrons, instead of steering a steady course as in the raids of the spring and last autumn, groped about in the darkness looking for a safe avenue of approach to their objectives. Three airships only were able to approach the outskirts of London. One of them appeared over the northern districts at about 2.15 a.m., where she was at once picked up by searchlights and heavily engaged by anti-aircraft guns and aeroplanes. After a few minutes the airship was seen to burst into flame and to fall rapidly towards the earth. The ship was destroyed; the wreckage, engines and the half-burned bodies of the crew being found at Cuffley, near Enfield.

"Our experts hope to be able to reconstruct certain portions of the framework. The large amount of wood employed in the framework of the Zeppelin is startling, and would seem to point to a shortage of aluminium in Germany.

"The other two ships which approached London were driven off by the defences without being able to approach the centre of the city. A great number of bombs were dropped promiscuously over the East Anglian and the South-Eastern Counties, but complete reports of casualties and damage have not yet been received. Those to hand indicate that the damage and loss of life are not heavy considering the number of the ships engaged, a great number of the bombs dropped having fallen either in the sea or in remote country districts.

"It is hoped that any persons who have picked up fragments of the wrecked airship will submit them to General Headquarters, Home Forces, the Horse Guards, Whitehall, without delay. If of no value in the reconstruction of the airship they will be returned to the owners. It should be remembered that the retention of such articles constitutes a contravention of the Defence of the Realm Regulations, Section 35 B. A statement of casualties will be issued to-morrow."

6 *p.m.*

"Careful inquiries show that the casualties and damage caused by the air raid last night were quite disproportionate to the number of ships employed.

"The number of casualties which have been reported are as follows :—

"Killed : 1 man, 1 woman.

"Injured : 11 men and women and 2 children.

"No casualties occurred in the Metropolitan Police District.

"The latest reports show that in the Metropolitan Police District 25 houses and some outbuildings were slightly damaged, two water mains were cut and three horses killed. Elsewhere the damage was very slight, a certain number of cottages being damaged, as well as a church, while a fire occurred at some gas works.

"No military damage of any sort was caused."

September 5th.

"An important part of one of the enemy's airships which raided England on the 2nd and 3rd inst. has been picked up in the Eastern Counties.

"There is no doubt but that the ship suffered severe damage from gunfire.

"The airship which fell near London passed through heavy and accurate gunfire, but it is established beyond doubt that the main factor in its destruction was an aeroplane of the R.F.C., which attacked with the utmost gallantry and judgment and brought it down.

German Version.

Berlin, September 4th.

"During the night of September 2nd-3rd several naval airship detachments bombarded the fortress of London and the fortified places of Yarmouth and Harwich, as well as factories and places of strategical importance in the south-eastern counties and on the Humber.

"Everywhere good effects could be observed, both on account of the violent fires which broke out and the explosions. Notwithstanding a strong bombardment all the naval airships returned undamaged.

"At the same time a number of army airships executed an attack on southern England."

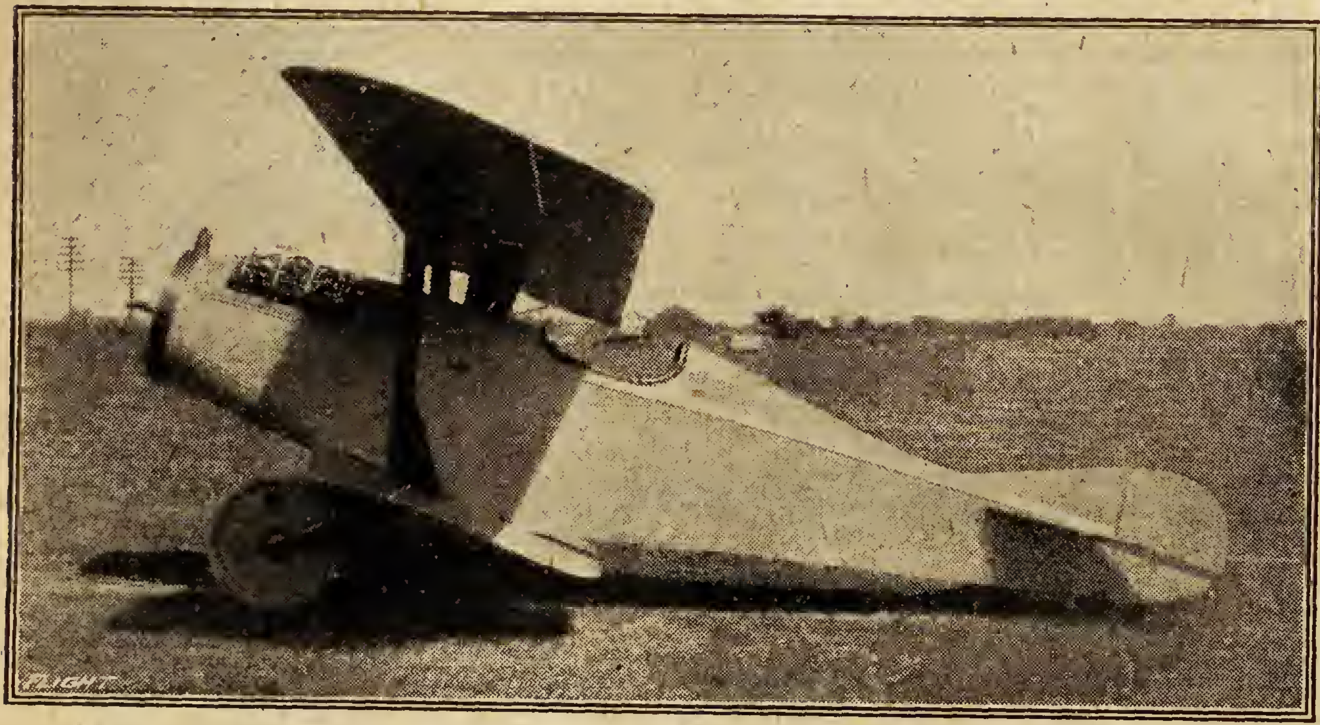
To the above the Press Bureau issues the following note :—

"The damage done, that is to say, practically nil, is exactly what has been reported in the official communiqué. There were no conflagrations of any importance and no explosions.

"There is, moreover, the strongest reason to believe that another airship in addition to the one destroyed was very seriously damaged."

In a later report issued in Berlin it was admitted that "one of our vessels was brought down by enemy fire."

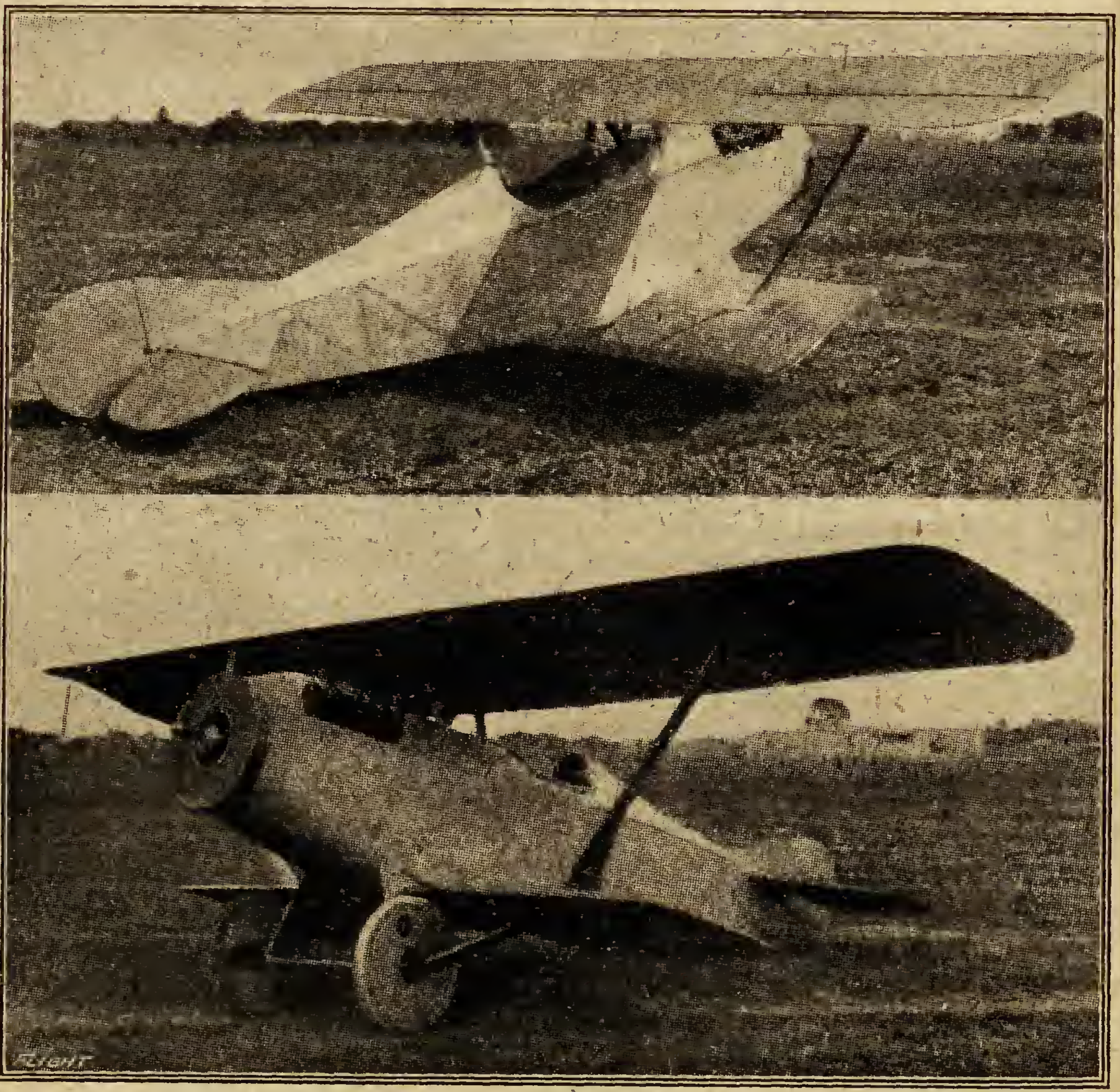
A NEW CURTISS "WIRELESS" SCOUT.



Side view of the Curtiss (Type S-2) "wireless" scout.

On August 9th some very interesting trials were carried out at the Curtiss Aerodrome, Buffalo, N.Y., when Victor Carlstrom, the well-known Curtiss pilot, put the new Curtiss model S-2 "wireless" scout through her paces. Equipped with a 100 h.p. Curtiss engine, the machine made a speed of 119 m.p.h. over a measured course. This is claimed to be a world's record for speed with an engine of this power.

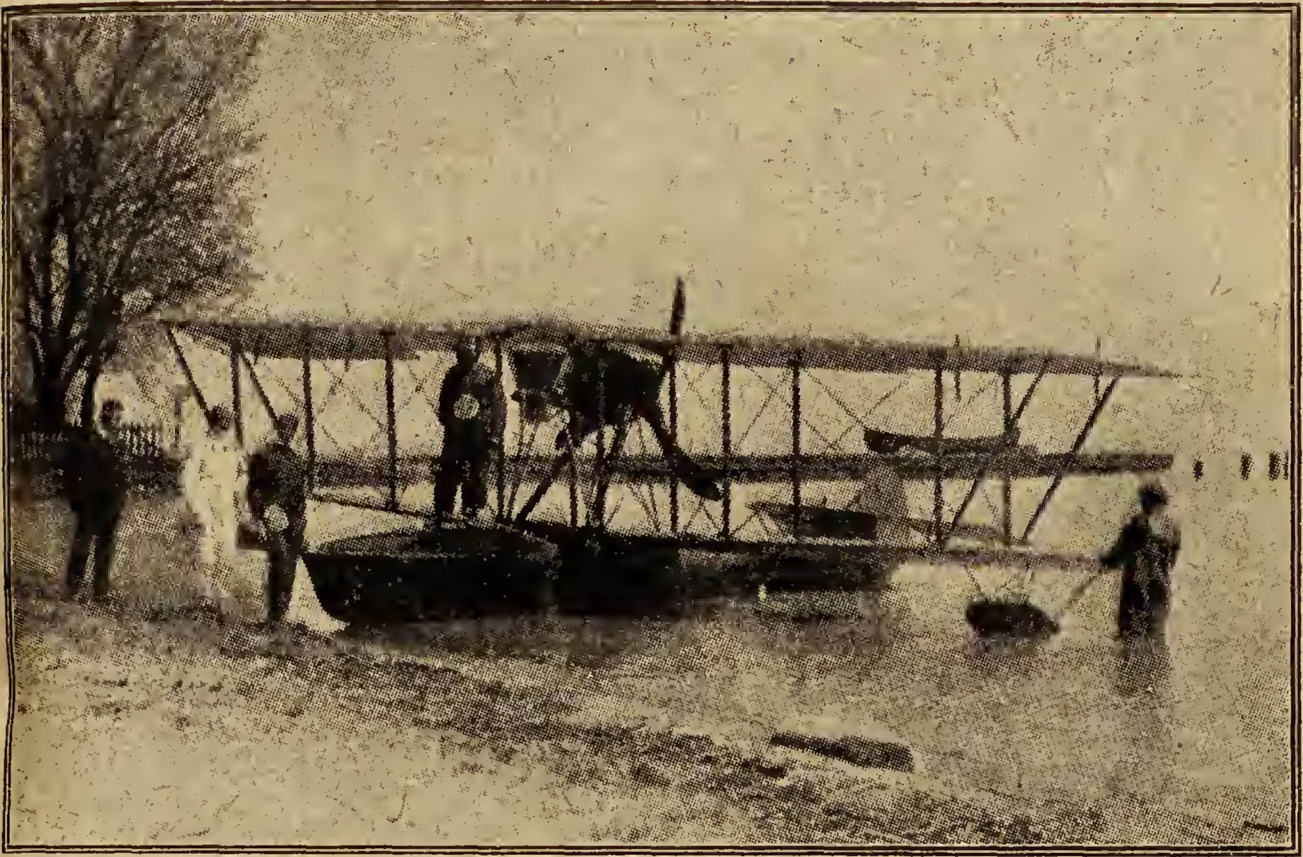
As regards the body, the new scout, it will be seen, is very similar to the previous type Curtiss scout, but several alterations are noticeable in the arrangement of the main planes. In the first place, the lower wing is of quite short span, and a single strut on each side connects it to the upper wing. This strut is spread out at its upper and lower ends so as to take care of the travel of the centre of pressure for various attitudes of the wing. No external wire bracing of any kind is employed in the wing structure, the single strut effecting all the trussing. The under-carriage is also of an unusual type. In addition to the usual "V" chassis, there are struts sloping backwards and outwards from the axle to the lower wing spars at the point where is attached the inter-plane struts. When the machine is in the air, these struts, it will be seen, are working in tension, thus partly taking the place of the usual lift wires. Some slight "cleaning up" changes in the design including an annular conical stream-lined casing over the boss of the tractor screw, are being made which will, it is anticipated, increase the speed of the machine to about 125 m.p.h. The span of top plane is 21 ft. 10 ins., and bottom plane 11 ft. 3 ins.



Three-quarter rear view and three-quarter front view of the new Curtiss "wireless" scout.

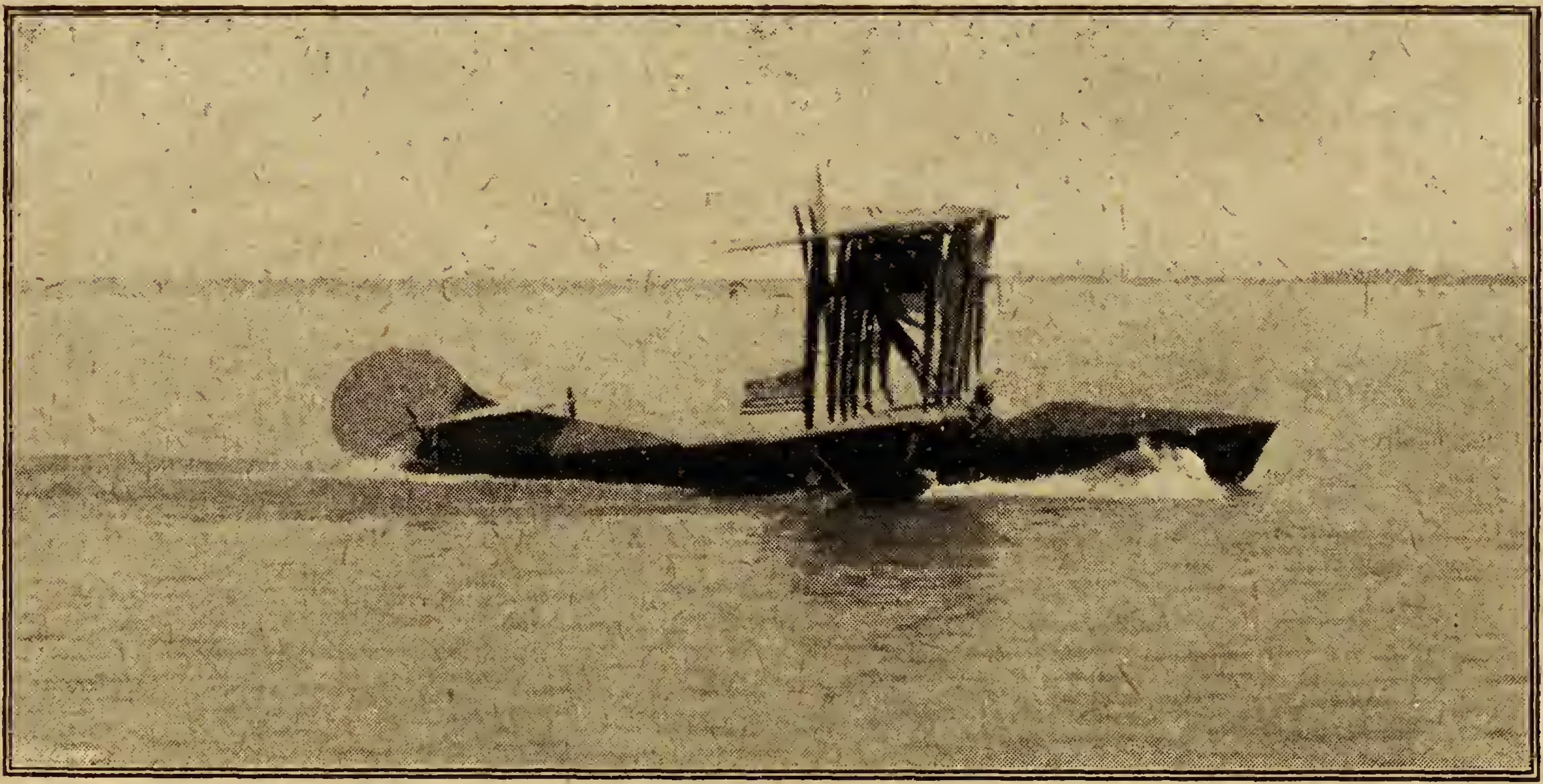
THE GENERAL AEROPLANE CO.'S FLYING BOAT.

REALISING the increasing popularity of the flying boat among sportsmen in the States, more and more of the American manufacturers are turning their activities in that direction. Among others, the General Aeroplane Company, of Detroit, Mich., have recently produced a flying boat that is especially adapted for sporting purposes, and its general lines are shown in the accompanying scale drawing and illustrations. In the "Verville" flying boat, named after its designer, Alfred V. Verville, the Company has aimed at producing a craft embodying the best principles of construction with an efficient design rather than to attempt anything in the way of novelty.

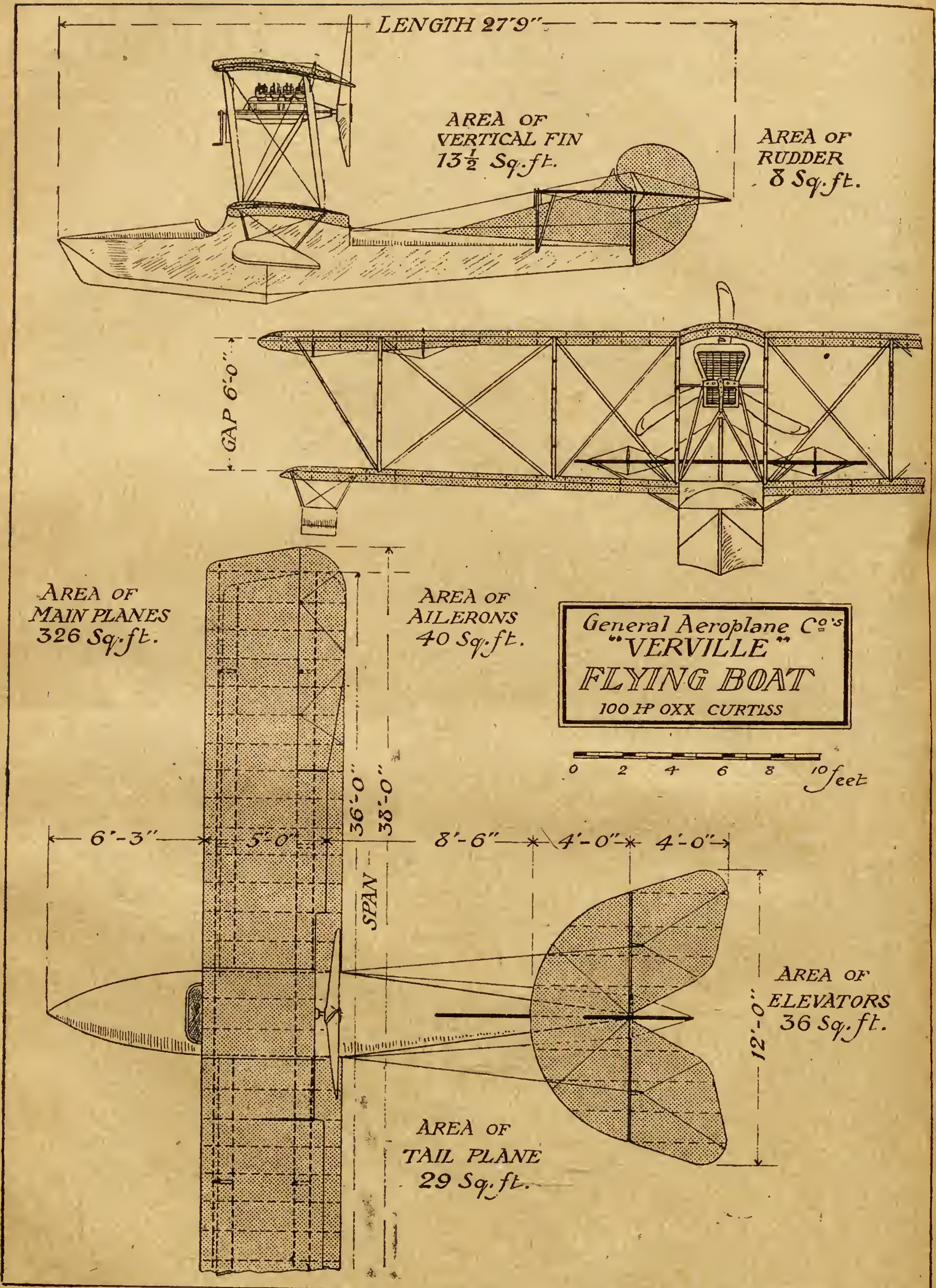


A general view of the General Aeroplane Co.'s flying boat.

The hull is built up of Honduras mahogany double-planked, with aluminium bulkheads forming four watertight compartments, and has a concave vee bottom, with off-sheered deck and D-shaped tail. Aluminium handhole covers are provided, rendering access to various parts of the hull. The cockpit, which seats two side-by-side, is veneered with $\frac{1}{8}$ in. Honduras mahogany and upholstered with green leather, filled with "Kapok." The polished mahogany dash-board is equipped with altitude barometer recording to 15,000 ft.; "Tycos" inclinometer; "Tycos" speed indicator; "Tel" revolution indicator; petrol tank pressure gauge, oil pressure gauge, electric light switch, dash-board light, motor cut-out switch, hand throttle and magneto spark control. Four special Tungsten cells for lighting purposes are



The General Aeroplane Co.'s flying boat taxying on the water.


LENGTH 27'9"
AREA OF VERTICAL FIN 13½ Sq. ft.
AREA OF RUDDER 8 Sq. ft.
GAP 6'-0"
AREA OF MAIN PLANES 326 Sq. ft.
AREA OF AILERONS 40 Sq. ft.
General Aeroplane Co's "VERVILLE" FLYING BOAT 100 HP OXX CURTISS
0 2 4 6 8 10 feet
36'-0"
38'-0"
SPAN
6'-3"
5'-0"
8'-6"
4'-0"
4'-0"
AREA OF ELEVATORS 36 Sq. ft.
12'-0"
AREA OF TAIL PLANE 29 Sq. ft.

THE GENERAL AEROPLANE CO.'S FLYING BOAT.—Plan, front and side elevation to scale.

provided, and the hand-pump is located in a convenient position for the pilot at the side of cock-pit. The two streamline wing-floats are of mahogany, and have a displacement capacity respectively of 200 lbs.

The main planes are divided into sections, three for the top and two for the lower. The top planes are attached to a centre plane-section—which, it will be observed, is peculiar in that it is arched—supported above the boat by two pairs of struts, whilst the lower plane sections are mounted on the hull.

A highly efficient wing section (Eiffel) suited to the requirements of this type of machine is employed, and the planes are built up in the orthodox way on two main spars with ash compression ribs, and spruce webs and battens. Shelby oval steel tubing is used for the trailing edge, and the whole wing structure is braced with strong Roebling aviator wire. The framework is covered with Irish unbleached linen (having strength in weft of 91 lbs. per linear inch, and in warp of 103 lbs.) doped with nine coats of Emaillite, and surfaced with three coats of spar varnish. The interplane struts are of Virginia silver spruce, well seasoned and shellaced, and bound with grey silk ribbon to relieve shattering. The strut sockets are clamped around wing spars, thus avoiding the necessity of the securing bolts piercing the spars.

Hinged to extremity of top plane rear spar by five cold rolled steel hinges are the *ailerons*, which are interconnected. Lynite pulleys, having brass bushings throughout, are used for the control gear.

The tail planes consist of a semi-circular stabilising plane, mounted above the stern of the boat, to which the two elevator flaps are hinged, and a triangular vertical fin, to which the partly-balanced rudder is hinged. Either Deperdussin, Curtiss, or the makers' "three-in-one" systems of control may be fitted.

The engine, a 100 h.p. Curtiss OXX, is mounted above the hull under the top plane centre-section, and drives direct a three-bladed "Paragon" propeller, 8 ft. 3 ins. diam. by 5 ft. 6 ins. pitch, constructed of oak tipped with copper. A flat copper-tube cellular type radiator, in nickel-plated brass casing, and weighing 41 lbs., is mounted in front of the engine. The water capacity is 2½ galls. Starting the engine is accomplished from the cock-pit by means of a crank-handle.

View from below of the General Aeroplane Co.'s flying boat in flight.

A factor of safety of seven is used throughout the machine. All wiring is doubled (factor of safety taken on one cable), and French "National" turnbuckles are used exclusively; all cable is wrapped with copper wire, sweated with solder and at least three ins. long; control cables are extra flexible 19-strand cotton centre Roebling grade wire. Metal parts are either nickel or treated with non-corroding metal enamel.

The main characteristics are as follows:—

Span: top 38 ft., bottom 36 ft.; gap, 6 ft.; cord, 5 ft.; gliding angle, 1 in 7; length over all, 27 ft. 9 ins.; speed range, fully loaded, 42–70 miles per hour; weight (loaded), 2,050 lbs.; weight (unloaded), 1,450 lbs.

◆ ◆

Air Warfare in August.

An interesting summary of the results of fighting in the air during the month of August has been compiled by the *Times* as follows:—

"Judged by either the number of combats fought or the number of machines brought to earth, the air war on the Western front during August was far more intense and disastrous than in any one month since hostilities began.

"The total number of machines actually recorded in the British, French, and German *communiqués* as having been shot or driven down, destroyed or put out of action, or forced to land is 189. But this does not complete the tale of losses, inasmuch as British Headquarters twice reported that 'several' enemy machines had been driven down, and once that 'many others' had shared this fate in addition to the four specially given. Even the most modest construction of the general expression 'several' or 'many' would bring the grand total of the month's losses to over 200. Taking the actually recorded figures, 189 in August compares with 165 in July and 77 in June.

"The German flying service has suffered the most heavily. During the month 121 of its machines have been destroyed or driven down. As by far the largest number of aerial fights take place over the German lines, it is impossible to say how many of those driven down are destroyed and how many are merely damaged and put out of action for a greater or less period. Of the 121, British airmen claim 33 and French airmen the remaining 88.

"British Headquarters acknowledges the loss of 21 machines either in air fights with the enemy or by his gunfire, while five others, overtaken by a storm, failed to return. The Germans specifically claim only nine British and six French victims; the other 53 are simply classed as "enemy" machines. It is worth pointing out, as further proof—if that were needed—of the enterprise of British and French airmen in going out to meet the enemy over his own lines, that the German reports state that 21 aeroplanes were brought down by anti-aircraft gunfire. At the most 12 German machines were so accounted for by the French, and an even smaller number fell to British gunfire from the earth."

The Lights of London.

A new lighting order on the lines of that in force in the provinces came into effect in London on September 1st. It directs that all exterior lamps, except those specified by the police as necessary for the public safety, must be extinguished, while interior lights must be so shaded that no part of the pavement or roadway or any building, &c., is illuminated.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Aug. 29th, 1916	10,826	16	5
F. R. Simms	1	10	0
Collected at the Westland Aircraft Works, Yeovil (Forty-sixth contribution)	0	15	0
Total, September 5th, 1916 ..	10,829	1	5

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

THE ROLL OF HONOUR.

THE Secretary to the Admiralty announces the following casualties :—

Seriously Injured.

Flight Lieut. Cyril Tollemache, R.N.
Prob. Flight Sub-Lieut. H. E. Love, R.N.

Accidentally Injured.

Flight Sub-Lieut. L. E. Lander, R.N.
Lieut. J. Neale, R.N.V.R.

Slightly Injured.

Flight Sub-Lieut. J. A. Harman, R.N.

Previously reported Missing, now reported Killed.

Flight Com. C. E. Robinson, R.N. (Capt., R.M.L.I.).

The following casualties have been officially announced by the War Office :—

Killed.

Second Lieut. D. Clarke, R.F.C.
Second Lieut. H. C. Marnham, Yeomanry and R.F.C.
Second Lieut. J. C. M. Stewart, W. Yorks Regt., attd. R.F.C.
Lieut. W. Stobart, Durham L.I. and R.F.C.
Second Lieut. H. C. Tetlow, A.S.C. and R.F.C.

Previously reported Missing, believed Killed, now reported Killed.

Second Lieut. E. G. Ryckman, R.F.C.

Previously reported Missing, now reported Killed.

Second Lieut. C. V. Hewson, R.F.C.
Second Lieut. C. E. Rogers, R.F.C.
Second Lieut. R. P. Turner, R.F.C.
Major F. F. Waldron, R.F.C.

Died.

7339 1st Air-Mechanic S. A. Holmes, R.F.C.

Previously reported Wounded and a Prisoner of War, now reported Died of Wounds as a Prisoner of War in German Hands.

Second Lieut. H. Floyd, R.F.C.

Wounded.

Lieut. M. T. Baines, Yeomanry and R.F.C.
Second Lieut. G. R. Bolitho, Devon Regt., attd. R.F.C.
Lieut. W. H. Bragg, R.F.A. and R.F.C.
Second Lieut. R. E. Dangerfield, R.F.C.
Second Lieut. L. A. Davis, R.F.C.
Second Lieut. J. M. Drysdale, R.F.C.
Lieut. W. E. Harper, Durham L.I., attd. R.F.C.
Second Lieut. W. R. E. Harrison, R.F.C.
Second Lieut. C. D. Kershaw, D. of Wellington's Regt. and R.F.C.
Capt. C. C. Miles, R.F.C.
Capt. J. T. Powell-Whittaker, A.S.C., attd. R.F.C.
Second Lieut. H. M. Probyn, R. Warwick Regt. and R.F.C.
Second Lieut. L. D. Russell, R.F.C.
Second Lieut. L. T. Smith, Middlesex Regt. attd. R.F.C.
Second Lieut. J. C. Taylor, K.O. Scot. Bord., attd. R.F.C.
Second Lieut. G. S. Wood, Durham L.I., attd. R.F.C.

Previously reported Missing, now reported Wounded and Prisoners of War in German Hands.

Lieut. J. R. Dennistoun, Cavalry Spec. Res. and R.F.C.
Lieut. H. B. Russell, R.F.A. and R.F.C.

Missing.

Second Lieut. S. P. Briggs, Northampton Regt., attd. R.F.C.
Second Lieut. E. C. Callaghan, R.F.C.
Lieut. H. M. Corbold, R.F.C.
Second Lieut. R. T. Griffin, R.F.C.
Capt. R. G. Hopwood, Rif. Brig. and R.F.C.
Second Lieut. A. W. Reynell, R.F.C.
Second Lieut. C. Smith, W. Yorks Regt., attd. R.F.C.
Second Lieut. R. FitzR. Talbot, R.F.C.
Second Lieut. K. K. Turner, Gen. List, attd. R.F.C.
Lieut. R. D. Walker, R.F.C.

Previously reported Missing, now reported Prisoner of War in German hands.

Second Lieut. D. H. Macintyre, Arg. and Suth'd. Highrs. and R.F.C.

Previously Unofficially, now Officially, reported Prisoner of War in German hands.

Second Lieut. J. W. Toone, R. Irish Regt. and R.F.C.

Fatal Accidents.

AT an inquest held relative to the death of Second Lieut. G. W. Hall, R.F.C., it was stated that on returning from a cross-country flight on August 27th he turned into the wind and banked the machine steeply, with the result that it nose-dived to the ground. A verdict of "Accidental death" was returned.

AN inquest was held on Second Lieut. H. C. Jacks, R.F.C., on September 2nd. It was stated that when making a turn 500 ft. up the machine side-slipped and then nose-dived. The wreck caught fire. A verdict of "Accidental death" was returned.

Another Fokker to be on View.

ONE feature of the National Economy Exhibition which will doubtless prove very attractive will be a captured Fokker monoplane. We believe it is very little different to the one of which scale drawings and full description were given in "FLIGHT" of December 10th, 1915, except that it has a 100 h.p. engine instead of 80 h.p. The exhibition opens at the People's Palace, Stepney Green, on September 18th for a fortnight.

Ferdinand in the Cellar.

ACCORDING to information received in Zurich, King Ferdinand of Bulgaria is so scared of pilots from Salonica visiting Sofia that he has taken to sleeping in a cellar which has had its roof strengthened with steel plates.

Zeppelins in a Storm.

EIGHT Zeppelins were seen from various points in Holland during the evening of August 29th. Shortly afterwards a heavy thunderstorm broke and the airships returned, but two remained cruising near Vlieland for some hours, apparently hoping for a change of weather.

Further Aeroplanes from Australia.

A CABLE message from Melbourne states that the Australian Commonwealth Government has offered a further flying squadron to the Imperial Government, and the offer has been accepted. It will be recalled that an air squadron, comprising 28 officers and 180 men from Australia, was presented in February last.

The promise of the New South Wales Government to duplicate the gift for fighting aeroplanes to the War Office made by the citizens, has now been redeemed, says a message from Sydney.

ARMCHAIR REFLECTIONS

By THE "DREAMER."

In a period of time not averaging one second to a man I saw them destroyed. Twenty there were, perhaps even thirty, and I cheered. Like the rushing of a great wind through the forest that noise of cheering and clapping of hands arose from the darkened streets where previously voices were hushed in strained expectancy, where nerves danced to the insistent music of the guns.

Twenty there were, perhaps even thirty of my fellow men. Sons, brothers, husbands, fathers of little children who had thought of their father only that very evening at bedtime. Men of brains and ability. Men of a race high in science, in music, in literature, burned to death, their bodies turned to a charred mass in mid-air within the twinkling of an eye by a raging hell of fire that lit up the countryside like a gorgeous sunset.

In that moment of victory I lent my voice to the multitude, who cheered and cheered again. Five minutes afterwards I sat down and asked myself, "What am I? What are we all?"

Like a beam of silvery light she appeared in the darkened heavens. Slowly, without perceptible effort, she glided like a protecting angel keeping watch and ward over a sleeping world. A monument of magnificence to man's ambitions; testifying to his skill and ability in his aims and desires towards—what?

The answer came in the boom of guns, guns that viciously spat out missiles of destruction, guns that vomited potential annihilation to all in their path, guns whose every effort was directed towards annihilating that glimmering body of beautiful proportions and her living freight.

For that glittering body had been devised from the cunning of man's brain not for love of the beautiful. Not for any idealic purpose had the beautiful workmanship produced by men's fingers been welded into that wonderful silver ship sailing serenely above the clouds, emblematic of the poetry of motion in its highest possibility. Siren of old never presented fairer form to the Homeric seamen of Italy; none ever had greater wish to slay than this silver nymph. Sons were up there, brothers and husbands. Fathers, whose little children had thought of them in their prayers at bedtime, here sailed the night-sky endeavouring to destroy by fearful sudden death children in the darkness beneath. Fathers of those children beneath endeavoured to prevent the fulfilment of childish hopes and prayers by dealing death in mid-air. And because this is the twentieth century, because man was never so enlightened as he is to-day, because we are no longer barbarians, because of the progress of art and love and music and poetry, because of the mighty strides science has made in its bacterial researches with the object of protecting humanity, I could lend my voice to the multitude and cheer and cheer again at the sight of twenty, perhaps even thirty, of my fellow creatures burning to death 'twixt earth and sky.

Not always have I added my voice to the multitude to cheer at disaster. Time was—before the mad Hun set in to teach the world kultur—that I lent my pen as proxy for my voice to the multitude to condone with Germany in the loss by fire of her Zeppelin L.2.

With 28 persons on board the L 2 started from Johannisthal Aerodrome on the morning of October 17th, 1913. Within three minutes she was falling a flaming mass, not one single person of her human freight escaping with life. All the world sorrowed, and one of the first messages of sympathy was addressed by President Poincaré to the German Emperor.

As a unit in the multitude of genuine sorrowers I lent my pen. As a unit in the multitude of cheerers I lent my cheer just three years later. As a human being I sat down afterwards with mixed feelings and asked myself what I am, what we all are.

Under different circumstances I could go out to those poor charred bodies with tears in my eyes at their fate. Those little children out there should never again be brought to suffer the grievous loss they have now suffered could I prevent it. But the circumstances are not different, they are what they are to-day, and to-night should the same thing happen I shall cheer and cheer again to the echo, nor shall I again ask myself what I am.

I and mine and all those around me are intended victims of the mad hate of a mad despot. Victim he may be of hallucinations of world's power. Possessed he may be that his way is the right way, and that the whole world would be the better for his governorship, son of hell incarnate he is that his endeavours to attain his heart's wishes should not stop short of the murdering of innocent women and children.

But yesterday I was a human being with human feelings for my fellow man. To-day I cannot go so far as to wish reprisals—I am not yet so inhuman as that, though God alone knows what I may come to be—I cannot condone the murder of innocents, at least not yet. But if those beautiful silvery ships of death come again, as I know full well they will come—indeed, if I could inveigle them over to their fate so that I could have the satisfaction of seeing repeated that which I saw last night, I would do so—in the consummation of my purpose, active and inactive. I shall cheer and cheer again. For I am one of the products of kultur in the making. When the war is over I will sit me down again, not to ask myself what I am or what I have been, but what I am going to be. I know what I am now.

AIRISMS FROM THE FOUR WINDS.

Air surprise No. 1 got home.

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When will the winner be announced of the three prizes—Mr. Joseph Cowen's £2,000, Lord Michelham's £1,000 and Mr. W. Bow's £500—offered to the first airman or airmen to bring down a Zeppelin on British soil?

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Spain is launching out aviatically, and is taking up the early Blériot type for a standard.

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At least that is the only conclusion to be arrived at if a "Royal" photograph and inscription sent round this week for publication by a prominent agency is to be credited.

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A *réchauffé* is always a doubtful investment.

– – –

The Foolish Prophet.—"It is people who want titles who are telling us to-day that Germany is aiming to blow up London with a fleet of airships."—Mr. Ramsay Macdonald on August 2nd, 1908.

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Through Commander G. Grenville Grey the sum of £200 has been subscribed by various crews of the Anti-Aircraft Corps, to dedicate two bedrooms in the new extension of the Union Jack Club.

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Mr. G. H. Malins, of the Gaumont Co., one of the special operators who are responsible for the photographs of the Somme film, must have stored up very extensive experiences of modern warfare. Previous to the Somme film—for about one-third of which Mr. Malins is responsible—he was out at the Front taking kinematograph pictures for a year, and prior to the opening of the great Push on July 1st he had kinematographed from an aeroplane the whole of the Belgian and the British front from a height of 10,000 ft. to 13,000 ft. A section of the pictures he took on this flight has been shown in the picture theatres, but the greater part has been reserved for the use of General Headquarters. For a time he took pictures on the French front near the Vosges. He had a narrow escape just before the great offensive, two bullets passing through his service cap as he was taking down his camera, which had been fixed in a trench with the lens placed between sandbags. He then made his way back to a village into which the Germans were dropping tear shells. Finding his car, which had been left there, he drove away, but both he and his chauffeur were so affected by the tear shells that the car fell into a ditch, where they left it, carrying the camera some miles along a shell-swept road, but eventually delivering the films.

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Mr. J. B. McDowell, the other operator responsible for the Somme film, is managing-director of The British and Colonial Kinematograph Co., and went out specially for this work a few days before the start of the British offensive.

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Col. Sir Charles Cheers Wakefield has been appointed to the command of the City of London Volunteer Regiment.

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Will Sir Charles revise his decision not to be nominated for a second term of office as London's Lord Mayor?

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Several of the City Companies have passed resolutions asking him to do so, and the movement is spreading.

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The Council of the British Association, at Newcastle, on Tuesday, unanimously nominated the Hon. Sir Charles A. Parsons to fill the office of president of the Association at the Bournemouth meeting next year.

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The R.N.A.S. is now represented on the Corrosion Research Committee, in connection with the Institute of Metals, which is studying the effect of sea water on condenser tubes.

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Recent contributions received by the Lord Mayor for the Lord Kitchener Memorial Fund include 100 guineas from the Sopwith Aviation Co., Ltd.

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It might have been the new lighting regulations, or again it might have been the ground mist that caused the Zepps. to steer erratic courses, as though they did not quite know what's what. Of course, on the other hand, it might have been the guns, for these certainly made better practice than previously. It must have been quite sporty away up there, judging by the view from below.

Dame Rumour speaks of several new aerodromes which are in the making.

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More down Bournemouth way and otherwise.

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The War Office pupils now arriving at Hendon will find much to be thankful for, in that friend Mitchell thought well to pitch his tent, as it were, just outside the aerodrome gates. Just as Mrs. Billing "mothered" the "pups" at the Brooklands Blue Bird in the pre-war days, so may these find a comfortable home here on the spot and midst picturesque surroundings, for the cosy tea cabins surrounded by lawn and flowers are to be turned into sleeping places for embryo pilots.

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Rather a contrast, this, to the old days, when those having the fancy to become of the air had to sleep in the hangars with the machines, breathing the fumes of oil, petrol and dope. Waking in the morning it was a case of washing in a bucket, and boiling the kettle by the aid of a blowlamp before the fragrant aroma of Bohea came as a blessing. Still, they were great days, and produced some of the best.

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It is the custom for Lord Rothschild to entertain the City Beadles every year at Tring Park. This year the function has had to be passed, on account, we believe, of Lord Rothschild having placed his residence at the disposal of officers as a home of rest.

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Some men are born great, some achieve greatness, some have greatness thrust upon them, also places. Cuffley is now on the map for the first time, and with its three houses and an inn is probably for the moment the most talked of spot in the world.

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The Zepp. that came to an end at Cuffley was first picked up by the searchlights when flying straight away with London under her tail and no bombs dropped. Did she pass right over our little village without knowing it?

– – –

Thirteen Zepps. to thirteen casualties, including two deaths only, does not seem any great return for the biggest raid on record. The bringing down of the airship at Cuffley placed the balance of deaths a long way on the opposite side of the ledger.

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What could have been the cause of that intense ruby and crimson light in the burning airship? Can we take that and the non-dropping of explosive bombs in conjunction, and wonder whether this particular Zepp. was carrying something new for us in the way of frightfulness?

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"It is a pity that before we can catch a Zeppelin we must blow it up. A captive Zeppelin with a colossal pin through it would make such a popular object of exhibition."—*Birmingham Daily Post.*

– – –

This month is the month of the harvest moon, when Fair Luna approaches some thousands of miles nearer our earth than usually. If any Zepps. arrive round and about the 9th, we should get a good view of them. But will they?

– – –

Last week there appeared in "Flight" another sort of Rader with Phil as prefix. Amusing as were the pages of the *Jersey Brow Gazette* under his manipulation, we find that his popularity amongst his brother officers and with the local tradespeople of the district in which his R.F.C. unit was temporarily located, has very materially waned since his very unofficial and sudden departure across the "herring-pond" became known. There are, in fact, besides the W.O., several who are wondering whether this "raider" of their pockets intends to desert them altogether. Harvard aviation students, please note.

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The captured Fokker monoplane, which is to be exhibited at the People's Palace shortly, does not, we understand, differ greatly from the one on view at the Horse Guards Parade some time ago, and which was so fully described and illustrated in "Flight" at the time. She is fitted with a 100 h.p. Oberursel (German version of the Gnome) instead of an 80 h.p. engine of the same make, otherwise she follows along the same lines. Does not begin to touch the Morane, of which she is a "crib," for workmanship, or anything else for that matter.

The "Super-Fokkers," of which so much was heard some time back, were not, of course, such formidable engines of war as they were "talked" up to be. They were very like the ordinary Fokker, with the exception that they were well stream-lined, hence their power to dive at a tremendous speed. They were probably of the "neutral stability" type—that is to say, having their c.g., c.l. and c.d. practically coinciding, and therefore quick on the controls.

– – –

The practice of testing aeroplane motors in racing cars is growing in America. The hill-climb up the Pike's Peak highway, Cal., on August 12th was won by a Romano car fitted with an eight-cylinder aero motor of 402·12 cubic ins. displacement.

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Some interesting—in fact, "werry" interesting—developments may be expected in connection with the new Werry engine.

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Pace the Censor. This much may be said, however, that it is of the horizontally opposed type.

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But not the usual horizontally opposed type as we know it to-day.

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Some of the parts, of which there is ordinarily only one in each engine, are multiplied by two in the Werry, while in other instances the parts of which there are many in the orthodox motor are divided by two in the Werry.

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For the present readers must try and think it out for themselves.

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Not the least valuable feature of the Werry engine is that it is possible to get at the valves of one cylinder and to replace them while the engine is running. The engine will, we understand, be made for a start in two sizes—one smaller one, to be air-cooled, and a larger one to be water-cooled.

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The aeroplanes of our new ally Rumania bear the French red, white and blue rosette.

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Action is being taken by the Norwegian authorities against the captain of a Zeppelin who attempted to smuggle a cargo of rubber from Christiania, whether by Zepp. or otherwise deponent sayeth not.

– – –

The aeroplane has once again come to the rescue in the case of an emergency. The trials of a U.S. Navy seaplane at Hammondsport were being held up by the non-delivery of a new propeller, which had been constructed at Buffalo, 119 miles away. It was impossible to send the propeller by rail in time, so a Model R. 5 Curtiss military biplane was requisitioned to "deliver the goods." With the propeller lashed in front of the cock-pit, Victor Carlstrom started off from the Buffalo field, and arrived at Hammondsport 1 hr. 2 mins. later, having encountered a rainstorm *en route*. The test was then satisfactorily carried out, and on the following morning the aero-express carrier returned to Buffalo.

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Lieut. Laub, of the Danish Flying Corps, recently broke the distance record for Denmark on a 90 h.p. Curtiss machine by making a continuous flight of 435 miles.

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Wonder how many times round Denmark he had to fly?

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And whether it made him giddy?

TEN YEARS AGO.

*Excerpts from the Auto. ("*Flight's*" precursor and sister Journal) of September 1st, 1906. "*Flight*" was founded in 1908:—*

The Long-Expected Announcement.

It is announced from Spitzbergen, by way of Christiania, that owing to the lateness of the season Mr. Wellman has abandoned his plan of reaching the North Pole by airship.

Sir Hiram Maxim and the Conquest of Air.

Sir Hiram Maxim, it would appear, has become a convert to flapping flight as the best method of solving the aerial problem. . . . His views on the subject of the superiority of flapping flight are summarised in the following observations:—

"With regard to the aeroplane, I am not at all wedded to that system, although I have carried out numerous experiments with it. I have studied the question for a great number of years with the assistance of one of the greatest mathematicians in the world, and I am now inclined to the belief that there is another and a better way. I have lately been studying the movements of the wings of large birds, and I find that these may be closely imitated, and that without any levers, cams, connecting-rods or articulated joints. In short, I have discovered a means of performing the functions of wings in a very simple and direct manner."

The Santos Dumont Experiments.

Valuable information in regard to the Santos Dumont experiments has been supplied by Capt. Ferber, the well-known expert in such matters. As coming from him, the remarks carry special weight, and give a more encouraging view of the possible outcome of M. Santos Dumont's new departure than many people previously have been disposed to form. So far the aeroplane has only run on the ground on its wheels, but it is stated to be extremely controllable, and that with the 24 h.p. Levavasseur motor with which it is at present fitted, and with which on its bicycle wheels it attains a velocity over the ground of 25 kiloms. per hour, a very considerable lift is obtained.

An Aeroplane Controlled by Wireless Telegraphy.

Prof. Graham Bell's aeroplane, which apparently does not carry an operator, but is controlled by wireless telegraphy from the ground, has recently, it is cabled, gone through a satisfactory test in America. It is stated to have risen to a height of 200 ft. from the ground, turning a complete circle, and alighted within a few feet of the starting point.

FIGHTING ZEPPS. BY AEROPLANES.

A vivid account of the work of the aeroplanes in attacking the raiding airships has been told by an officer of the Royal Flying Corps who assisted in the work. He said that the machine which he was piloting, a high-power biplane, had reached an altitude of nearly 10,000 ft. before he was able to engage the raider.

"Two other aeroplanes were endeavouring to engage the airship, which was making frantic efforts to get away, at the same time firing with machine guns. The Zeppelin was travelling at top speed, first diving and then ascending, and apparently Lieut. W. L. Robinson, who was the officer piloting the biplane which had first attacked the raider, anticipated the manœuvre.

"The commander of the airship threw out tremendous black clouds of smoke, which completely hid him from our view, and in which he managed to rise. A few seconds later we saw the airship a couple of thousand feet above us, and at the same altitude was Lieut. Robinson, although a matter of, perhaps, half a mile away. Immediately Robinson headed his machine for the raider, and flying at a terrific speed, it appeared that he was going to charge the monster. I shall never forget the sight of the blazing airship as it fell. Away up above the clouds, 12,000 ft. from the earth, the scene was terrifying in its grandeur. A huge sheet of flame cast a brilliant red glow over the black sky above, tinting to a vivid pink the clouds beneath.

"As the Zeppelin took fire a second airship was seen approaching, and this now occupied our attention. The commander of that craft, however, seeing the fate of the first Zeppelin, evidently considered that discretion was the better part of valour, for he turned tail and scurried off as fast as his engines would enable him to travel. At such a height and in the darkness it was impossible to pick him up.

He had a good start, and made the most of it. I am told that German aeroplanes accompanied the Zeppelins, but of this all I can say is I saw none on Sunday morning, although other officers claim to have done so."

Personals

Under the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriage and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.

Casualties.

Flight-Commander Charles E. Robinson, R.N. (previously reported missing, now reported killed), was born in November, 1886, and entered the Royal Marines in September, 1904. He had promotion in July, 1905, and was appointed Captain in September, 1915, while his rank as Flight-Commander in the R.N.A.S. was dated February, 1915.

Lieutenant Robert Burleigh, R.E., attached R.F.C., son of the late Mr. Bennet Burleigh, the war correspondent, has been killed in action. His brother, Lieutenant Bennet Burleigh, of the Lancashire Fusiliers, died in July, 1915, of wounds received in Gallipoli. Two other brothers are still on active service. A brother officer, writing to Mrs. Bennet Burleigh, says: "Robert and I flew together until a few days ago, when he was given a different observer. I have done many hours in the air with him. Day after day we carried on our work, and I never saw him anything but cheerful. One day not long ago he fought single-handed six Huns when over on photography, and although his plane was badly hit, he landed perfectly. Robert was a true Britisher through and through. He accomplished feats in the air which Huns cannot understand possible, deeds which have given us command of the air. I have seen his grave, and when on leave I will give you one of my maps with the position marked." Lieutenant Robert Burleigh was educated at the City and Guilds Technical College, West Kensington, where he gained a number of scholarships and received his diploma for engineering.

Major Francis FitzGerald Waldron, Hussars and R.F.C., (previously reported missing on July 3rd, now stated to have fallen in action on that day), was 29 years of age, and only son of Brigadier-General Waldron. Born in August, 1886, he entered the cavalry in May, 1907, received promotion in May, 1910, and in January, 1913, was appointed to the R.F.C., in which he became an Instructor at the Central School in October, 1914. At mid-summer in that year he was promoted to Captain's rank in the cavalry. Major Waldron had served with great distinction in the war, and was mentioned in the early Despatches from Viscount French. He held the height record for the Army for several months, and was the first to reach Montrose in the first flight of Army aeroplanes to Scotland in 1913. He became squadron-commander in May, 1915.

Second Lieutenant Donald Clarke, R.F.C., who was killed on August 26th, was the eldest son of Mr. Arthur J. Clarke, Town Clerk of High Wycombe. Mr. Clarke, who was 21 years old, was educated at Seafield College, near Bexhill, Mill Hill and St. John's College, Cambridge. He enlisted in August, 1914, and served for over a year in the trenches with the H.A.C. He received a commission in the R.F.C. last May, and was an observation officer.

Lieutenant James Robert Dennistoun, Irish Horse, attached R.F.C., died at Ohrdruf, in Thuringia, Central Germany, on August 9th from the effects of wounds received while flying. His biplane caught fire and he had to descend in the enemy's lines. He was the elder son of George James Dennistoun, of Peel Forest, Canterbury, New Zealand, a member of a younger branch of the old family of Dennistoun, of Dennistoun and Colgrain. He was born at Peel Forest, was educated at Wanganui and Malvern College, and was a Justice of the Peace for New Zealand. Lieutenant Dennistoun was a member of Captain Scott's Antarctic Expedition, 1910–11, and was awarded the King's Antarctic Medal and that of the Royal Geographical Society. After leaving school he had taken up sheep farming, but he took the keenest pleasure in mountaineering. He made the ascent of many of the snow-capped Southern Alps in New Zealand, amongst them that of several virgin peaks. He also climbed, alone, Mitre Peak, in Milford Sound, which had up to that time been considered inaccessible. Lieutenant Dennistoun, who did a considerable amount of exploration work, was a member of the Alpine Club. On the outbreak of war he returned to England and obtained a commission in the Irish Horse. He went to the Front last November, and was for some months intelligence officer to a Division, afterwards joining the R.F.C. His brother, Lieutenant-Commander George Dennistoun, D.S.O., R.N., is on active service abroad.

Wounded.

Second Lieutenant Geoffrey Richard Bolitho, Devonshire Regiment, attached R.F.C., who is reported wounded, is a son of the late Captain E. A. Bolitho, R.N., Rockbeare House, near Exeter, and was born in 1893. He joined the regiment mentioned as a Second Lieutenant as soon as the war broke out.

Married and to be Married.

The engagement is announced between Flight Lieutenant F. M. L. Barr, R.N., eldest son of Engineer-Commander E. Barr, R.N., and Mrs. E. Barr, of Mossgeil, Rainham, Kent, and Ruby, only daughter of Dartford Holmes, of Huddersfield, and grand-daughter of the late H. J. Chapman, The Firs, Westgate-on-Sea.

An engagement is announced between Lieutenant Geoffrey R. Bromet, R.N. (Squadron-Commander, R.N.A.S.), eldest son of Mr. and Mrs. George A. Bromet, of Tadcaster, Yorkshire, and Margaret, eldest daughter of Major R. Ratliffe, Worcestershire Regiment, and Mrs. Ratliffe, of Lillington, Leamington Spa.

Captain Arthur Travers Harris, Flight-Commander in the R.F.C., was married at St. Augustine's Church, Queen's Gate, on the 30th ult., to Barbara Kyrle, only daughter of Major E. W. Money, formerly of the King's Shropshire Light Infantry, and of Mrs. Money, of Seaforth, Bexhill.

The engagement is announced between Captain O. E. S. Mosley-Leigh, R.F.C., only son of Colonel Mosley-Leigh, of Belmont Hall, Northwich, Cheshire, and Mary Eleanor Olive, elder daughter of C. L. Stirling-Cookson, of Houndwood and Renton, Berwickshire.

The marriage arranged between Mr. Cuthbert Orde, R.F.C., and Lady Eileen Wellesley will take place at St. Bartholomew-the-Great, Smithfield, on September 11th, at 2 o'clock.

Items.

From Second Lieutenant S. Howard Ellis, R.F.C., comes an interesting letter, via his cousin. At present Mr. Ellis is a prisoner of war at Stammlager Wahn. In this letter the Hun, to his prisoner, is not painted as black as one finds his character depicted from other prison centres. May be Mr. Ellis has felt that he should be more or less diplomatic in his communications in order that he may get his news through to home. At least his story in a measure corroborates the opinion that with the *personnel* of the Flying Corps of the opposing countries there is a much kindlier feeling of *camaraderie* from all sections of the army than with the rest of the units. The letter runs thus:—

"I wonder if you have heard about me yet? I hope so. In case not I will tell you at length all about my little self. I was brought down by Archie (the anti-aircraft gun, you know) at 7.30 a.m. on July 3rd. I had just finished a rather tricky job most successfully. My flight was almost identical in its incidents with my first flight on July 1st, but I had flown lower and been more successful. I was feeling rather bucked with life. I had to cross the lines on return at 2,000 ft. Unluckily Archie was very accurate, and one shrapnel shell burst mighty close. A piece got my left leg just below the knee and broke the bone, putting the leg out of action.

Another bit pierced my neck to the throat and caused blood to flow a bit. I did not look to see how much the machine was hit. It knocked me out for a moment. When I recovered a bit I found the machine had dropped to 1,000 ft., and was in a devil of a spin owing to my left leg being off the rudder. I was on the German side of the lines. I tried to recover control and direct the 'bus to our side; tried to get my right leg round the joystick (control lever, *i.e.*); but it was no go. I still lost height and was feeling very groggy. Archie was pelting at me cheerily. As I neared the ground I had sense enough to switch off (to prevent fire), and the machine, by good luck, landed in a decent field and turned up on its nose, but not right over. It was pretty well crashed. Luckily I was strapped in. A number of Germans soon came up; they lifted me carefully out. As long as I live I will bless them for their gentleness, for I really felt a bit seedy then. A Red Cross doctor gave first aid, &c., and after some time I was removed by motor ambulance to a field hospital. Those fellows in the field *were* decent to me. . . . I was lucky in my field hospital. . . . For the first day or so I could not swallow, and was rather a crock, but each day I got a bit better. After five days my old leg was laid to rest in plaster-of-Paris. . . . I was ten days in the field hospital and was sorry to leave all my friends there—they were such topping good fellows, they spoiled me. . . . I came here by motor ambulance on the 13th. This is a large hospital, very well fitted up and well run. It was thought that X-rays and an operation on my neck were necessary to remove the shrapnel. But in the middle of that night I was coughing like the deuce (ever since the 3rd, I had coughed a great deal), and out came a tidy piece of shrapnel. Great joy! No operation now necessary. . . . I am in a ward by myself, being, I think, the only officer here, but I am never lonely. A quite delightful young pilot of the German Flying Corps spent most of yesterday with me. He speaks English well, and is most interesting. He is coming again. I may be here a week or more, then move on to a hospital further back.

"I am allowed to write two letters and four postcards a month (can receive as many as I like)."

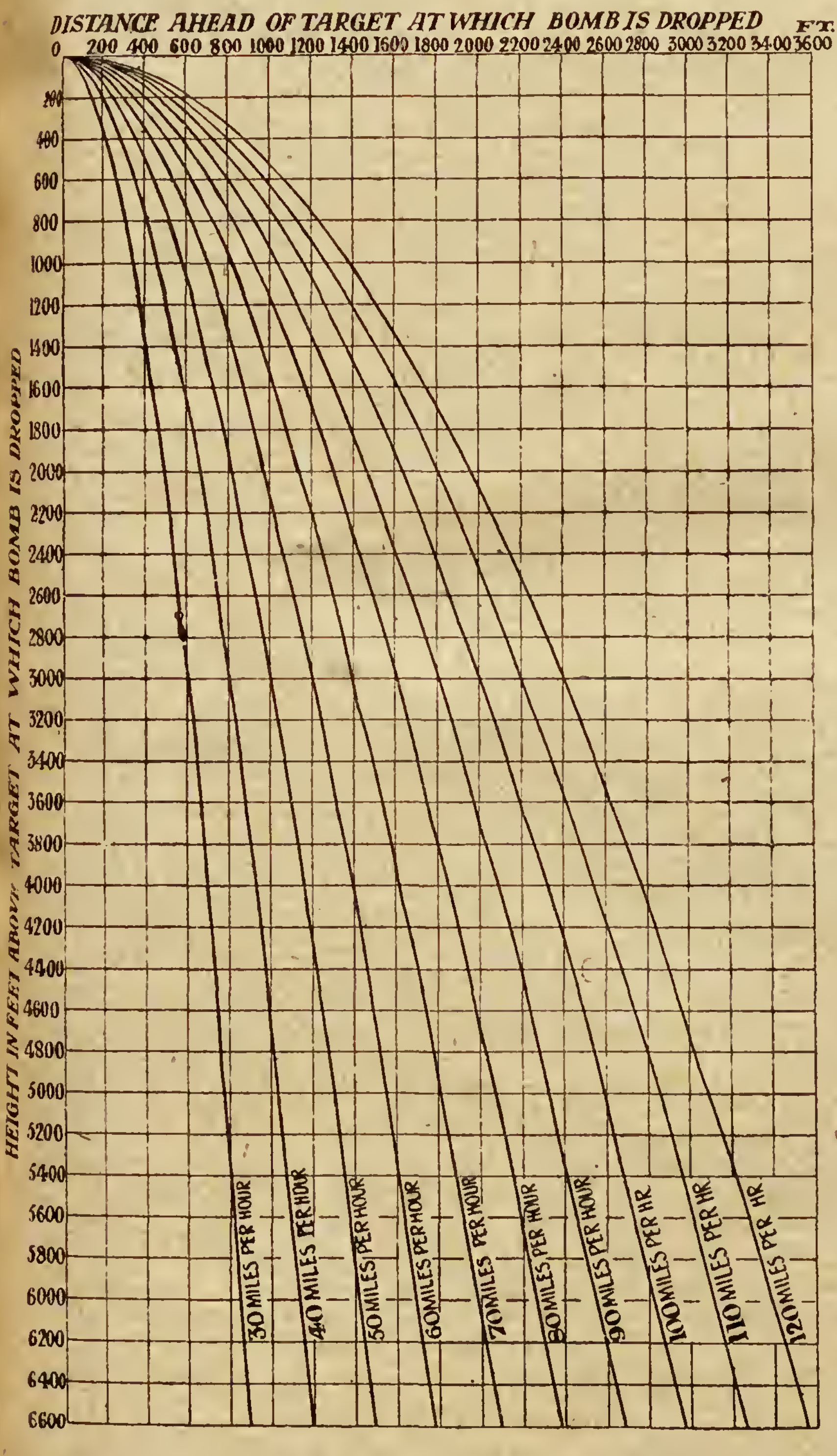
* * *

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

W. T. P. (Eastleigh).

The accompanying graph, reproduced from our issue of December 18th, 1914, will, we think, give you the information you require. It represents the trajectories of a falling body discharged from an aeroplane travelling at speeds varying from 30 to 120 m.p.h., neglecting air resistance. The path a bomb would follow would differ somewhat, owing to the resistance of the air, and would be influenced by the shape of the bomb. In the case you mention you will see that if the bomb were released immediately over the object it would strike the ground 1,900 ft. beyond the object.



V. B. (West Hartlepool).

1. Rudder bars are now frequently made with a recess for the pilot's feet in order to prevent slipping off. Also, in many cases, the control wires running from the foot bar to the rudder crank lever are attached to the bar on the outside of the pilot's feet, so that the wires themselves prevent the foot from slipping.

2. It would be quite possible for a machine to fly with perfectly flat planes, but the area would have to be much greater than in the case of a cambered plane, as the flat plane is not nearly so efficient as the cambered wing.

3. The copies of "FLIGHT" containing the reports of the cross-Channel flight and of the first Rheims meeting are obtainable from the publishers, the first being No. 31, Vol. I, the other two being Nos. 35 and 36, Vol. I.

A. S. (Margate).

The world's aviation altitude records up to June 30th, 1914, are:—Aviator only: 6,120 metres, Legagneux (French). Aviator and one passenger: 6,170 metres, Bier (Austrian). Aviator and two passengers: 5,440 metres, Bier (Austrian). Aviator and three passengers: 4,770 metres, Loessl (Austrian). Aviator and four passengers: 3,050 metres, Garaix (French). Aviator and five passengers: 2,230 metres, Garaix (French). Aviator and six passengers: 1,750 metres, Garaix (French). Aviator and seven passengers: 1,600 metres, Garaix (French). Aviator and eight passengers: 1,530 metres, Garaix (French). Aviator and nine passengers: 1,590 metres, Garaix (French). Aviator and 15 passengers: 300 metres, Sikorsky (Russian).

Before the outbreak of war, but not in time to be homologated by the Fédération Aéronautique Internationale, the German pilot, Oelerich, attained a height of 8,150 metres; and other altitude records, notably with several passengers, have been beaten in this country during the war. Of these, however, nothing must be said at present.

R. W. P. (South Farnborough).

Thanks for letter of congratulation. We are glad to hear that our readers like the "Column."

F. U. (S. Farnborough).

Your first question, regarding the variation in density with altitude, has already been dealt with in our last issue. Other things being equal the thrust of any propeller is in direct proportion to the density of the air. The thrust obtainable with a given motor is found by the formula $T = \frac{550\,H\,E_p}{v}$, where T = thrust delivered at propeller, in pounds, H = brake horse-power of engine, E_p = efficiency of propeller, expressed as a decimal, v = velocity of machine, in feet per second. A fair average for propeller efficiency is 0·75. Thus, for a 50 h.p. engine, assuming a propeller efficiency of 75 per cent., and at a translational speed of 100 ft. per sec., or nearly 70 m.p.h., the thrust would be $T = \frac{550 \times 50 \times 0{\cdot}75}{100} = 206{\cdot}25$ lbs.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), August 29th, 9.45 p.m.

"Yesterday in some aeroplane encounters four of the enemy's machines were accounted for, two being destroyed and two badly damaged. Two of ours are missing."

War Office, August 30th.

"*Salonica.*—On the 29th our aeroplanes bombed Drama Station and troops and transport at Porna, with apparently successful results."

General Headquarters, September 1st, 10.49 p.m.

"There was great aerial activity yesterday and many combats with the enemy, in which five of his machines were destroyed and at least seven others driven down much damaged. We undertook several bombing expeditions, which were successful. Five of our aeroplanes were lost."

War Office, September 1st.

"*Mesopotamia.*—With the exception of two successful bombing raids carried out by our aeroplanes against the Turkish positions on the Tigris front, there are no fresh developments to report."

War Office, September 2nd.

"*Egypt.*—Hostile aeroplanes bombed Port Said in the early hours of September 1st. In all 25 bombs were dropped, causing some casualties. No damage is reported.

"*Salonica.*—Our aeroplanes bombed Angista Station."

War Office, September 4th.

"*Egypt.*—An enemy aeroplane dropped three bombs on Rabah (about four miles east of Katia) on the morning of September 3rd. We suffered some casualties, but no damage is reported."

General Headquarters, September 4th, 12.30 a.m.

"Our aircraft did most useful work in co-operating with the artillery and infantry.

"The enemy's aeroplanes, which made desperate attempts to interfere, were successfully engaged in many aerial fights, and driven off with the loss of three machines destroyed and at least four others damaged, while we lost three."

French. *Paris, August 29th. Evening.*

"*Salonica.*—Lively artillery activity is reported in the region of Lake Doiran and on the banks of the Vardar, where we destroyed an aviation park at Maizenchi (west of Lake Doiran)."

Paris, August 30th. Afternoon.

"A German aeroplane was brought down in a fight by one of our pilots. The enemy machine came crashing to the ground near Fresnes, in the Woevre."

Paris, September 1st. Afternoon.

"In spite of the mist and clouds which prevailed over the greater part of the front, our flying services were particularly active. On the Somme front four German machines were brought down; one which was fired on with a machine gun at very close quarters by Warrant Officer Dorme came crashing to the ground near Manancourt. This is the eighth enemy machine brought down up to the present by this pilot. The three other machines were brought down south and south-east of Peronne. Two other machines were seen to fall damaged in the same region.

"In Champagne an Aviatik, which was seriously hit in an air-fight, fell inside the German lines north of Somme-Py. Another enemy machine which was hit by our special guns was forced to land north-east of Somme-Suippes. The two aviators were made prisoners.

"Finally, near Bicquebourg (Oise) a German machine having landed in our lines owing to engine trouble, the passengers were taken prisoners."

Paris, September 1st. Evening.

"Three German aeroplanes were brought down this afternoon by our special anti-aircraft guns. Two of them fell on the right bank of the Oise, and the third near Douaumont. About 3 o'clock this afternoon an enemy aeroplane dropped two bombs on Giromagny. The material damage done was insignificant. One man was wounded."

Paris, September 3rd. Afternoon.

"One of our airmen brought down a German aeroplane, which fell close to Dieppe (north-east of Verdun). On the Somme front four more German aeroplanes were badly hit in encounters, and descended abruptly in their own lines. Our bombarding air squadrons carried out numerous operations yesterday with excellent results. Our squadrons twice visited the railway station of Metz-Sablons, and threw altogether 86 120 mm. bombs on the buildings and railway tracks.

"The damage observed was considerable. Sixty 120 mm. bombs were also dropped on the military establishments north of Metz. Our aeroplanes bombarded the stations of Maizières-les-Metz, Conflans, Sedan and Audun-le-Roman, as well as the cantonments and depôts at Ham, Nesle, Guiscard, Athis and Monchy-Lagache. In all 210 bombs were dropped on these places. Numerous bursts on the targets and outbreaks of fire in many places were observed."

Russian. *Petrograd, August 30th. Afternoon.*

"In the region north of Dvinsk in the course of an air battle one of our machines brought down a German Fokker, which fell in the enemy's lines."

Petrograd, August 31st.

"In the direction of Kowel, in the region of the village of Velitsk, two enemy aeroplanes attacked one of our machines, which was brought down and fell in our lines. The gallant aviators, Second Lieut. Tikhomiroff and the observer, Lieut. Danilevitch, were killed."

Petrograd, September 1st.

"South of Lake Wygonowskoie, on the Oginski Canal, our artillery brought down an enemy aeroplane, which, after it had come to earth in the enemy's lines, caught ablaze and was burnt.

"In the Volhynia region, during the course of the fight, enemy aeroplanes made uninterrupted reconnaissances. Our aviator, Ensign Filippov, with an observer, Sub-Lieutenant Khrizoskoley, attacked an enemy machine, which, having side-slipped, turned nose downwards and fell steeply to earth."

Italian. *Rome, August 29th.*

"An enemy aeroplane dropped bombs and arrows on the Cortina D'Ampezzo Basin, but without causing damage."

Rome, August 30th.

"Enemy aeroplanes dropped bombs on Alleghe and on the Lagoon at Maravo, wounding a few persons and causing some slight damage."

Rome, August 31st.

"Hostile aircraft dropped numerous bombs on the lagoon at Marano, killing one woman, wounding a few civilians, and causing slight damage."

Rome, September 1st.

"Enemy aircraft dropped bombs on Proveni and Lapai without doing any damage."

Rome, September 2nd.

"Hostile aircraft dropped bombs on Rolle Pass, at the head of the Cismon Valley (Brenta) and the Agordo Basin (Cordevole Valley). No damage was done."

Rome, September 3rd.

"A hostile aeroplane dropped bombs on Ansonzo, in the Anziei Valley, without causing any damage or casualties."

Roumanian. *Bucharest, August 30th.*

"Last night a Zeppelin and a foreign aeroplane dropped several bombs on Bucharest, without causing the least damage. Artillery drove them off.

"Enemy aeroplanes dropped bombs on Baltchik and on Piatra and Neamtu, without doing any damage."

Bucharest, September 3rd.

"Three hostile seaplanes dropped bombs on Constanza (on the coast). Several children and civilians were wounded."

German. *Berlin, August 29th.*

"Three enemy aeroplanes were shot down in air fights, one south of Arras and two at Bapaume. A fourth machine fell into our hands undamaged east of St. Quentin."

Berlin, August 30th.

"North of the River Ancre and west of Muelhausen two enemy aeroplanes were put out of action in an air fight. Two aeroplanes were brought down by anti-aircraft fire north of the Somme, and another machine was forced to land within our lines near Sovecourt."

Berlin, August 31st.

"In the course of an attack on military works at Lutzk and Torczyn our airmen shot down three enemy aeroplanes

Another enemy machine was put *hors de combat* on Tuesday at Listopady, on the Beresina."

Berlin, September 1st.

"In the Somme sector we shot down in air fighting six enemy aeroplanes and on the Meuse one enemy aeroplane. Another fell down east of Ypres under our anti-aircraft fire."

Turkish. *Constantinople, August 30th.*

"On August 27th hostile airmen unsuccessfully dropped bombs upon some parts of the coast region."

Bulgarian. *Sofia, Aug. 31st.*

"An air squadron attacked the bridges near Buk Railway Station. No damage was done, nor were any lives lost."

British Air Work.

THE following *résumé* of incidents, extracted from recent reports of the Royal Flying Corps in France, has been received from the Air Board :—

"Bombing raids as follows were carried out on the night of July 31st to August 1st : 32 heavy bombs were dropped on the dump at Corons ; the railway track, a bridge over the road, and some of the station buildings were hit. Thirty heavy bombs were dropped on the hostile aerodrome at Queant ; one shed was set on fire and another damaged ; the railway station adjoining the aerodrome was also hit. The aerodrome at Ancoisne was attacked and two sheds hit.

"A further attack by 16 of our machines was made on the station sidings and dumps at Ledeghem ; much damage was caused and three fires started ; in the course of this raid one of our escorting machines brought down a Fokker, which was seen to fall to earth in a field south of Poelcappelle.

"A bombing raid by nine of our machines was carried out on the Zeppelin sheds at Brussels on August 2nd. No direct hits were observed on the sheds, though heavy bombs were seen to explode very close to them. Anti-aircraft gunfire was opened on our machines, which had descended to 1,000 ft. to drop their bombs, but it was inaccurate. One hostile machine was seen, but it did not attack. All our machines met at their appointed rallying place after the raid, and all returned in safety, having picked up an escorting patrol on their return journey. The whole raid took five hours.

"Another raid, composed of 13 machines, was organised against Courtrai Station with a view to assisting the return of the Brussels raiders. Direct hits are reported to have been obtained as follows : Three on rolling-stock, two on buildings adjoining station, four on the railway yard and one on the main line. All machines returned safely. The anti-aircraft fire was very heavy during the attack, and a considerable number of hostile aircraft were engaged by the escort.

"In the forenoon of August 3rd eight of our bombing machines, accompanied by an escort, left to attack the Ronet sidings at Namur and the airship sheds at Cognelée. Five of the machines reached their objective, and considerable damage in both cases was caused. A good deal of anti-aircraft fire was encountered when attacking the airship sheds.

"A patrol machine sighted a hostile machine over Ypres, and in a 10 minutes' fight fired 12½ drums of ammunition. The hostile aeroplane, driven down from 11,000 to 5,000 ft., plunged to earth.

"Four of our fighter aeroplanes encountered seven hostile machines on August 3rd near Flers. In the fight which ensued, and which lasted for 45 minutes, six of the enemy machines were driven down, and the seventh broke off the fight.

"One of our Nieuport aeroplanes on patrol on August 8th, at 17,000 ft., observed an Albatros circling between Armentières and Lille. The pilot waited until the hostile machine had made two circuits, and then dived and attacked it from behind and below. A long shaft of flame burst from the hostile machine, and our aeroplane had to turn quickly to avoid the flame, the heat of which was felt by the pilot. The hostile machine fell and hit the ground near Frelinghien, one of the occupants having already fallen out.

"One of our fighter machines engaged four hostile aeroplanes over Bapaume. Attacking one from underneath, our pilot forced it down in a nose dive, and it was seen to fall to earth east of Bapaume by independent witnesses. The British machine, though badly damaged, managed to regain our lines in safety. Later, another pilot attacked single-handed three L.V.G.'s, which were attempting to cross our lines, and turned them all back.

"Seven of our machines carried out a successful bombing raid on the railway and factories at Blanc Misseron, east of Valenciennes, on August 12th."

The following account of an encounter in the air on August 2nd was received from a pilot recently wounded :—

"After dropping bombs on Mareoing (south-west of Cambrai) I turned round and almost ran into an L.V.G. I fired a drum at him and he passed underneath me. I saw one of our machines engage him, and, while changing drums, I was attacked in front by a Roland. I fired a drum at this machine, and, hearing a machine gun behind me, looked round and saw three Rolands on my tail. I was hit in the leg almost immediately, but managed to give the hostile machines a drum from my side gun, on which they went away. My engine started spluttering, and I saw a hole in my petrol tank. My engine then stopped, and I then started gliding down, thinking I should have to land. The petrol was flowing over my left leg, but I managed to put my left knee over the hole in the petrol tank. It occurred to me that by pumping I might be able to get a little pressure. When I was only 200 ft. up my engine started. I was then about 15 miles from my lines. I kept pumping hard, and just managed to keep enough engine to keep going, though I thought I should have to land three or four times. Once I had actually flattened out to land when the engine picked up just in time, and I managed to cover the 15 miles to the lines at an average height of only 50 ft. I had lost myself, and was so low that I could see very little of the country. So, seeing a French biplane flying low, I followed it and eventually landed, crashing the machine in doing so. I was feeling very weak, as I had lost a lot of blood, and was exhausted by having to pump for so long. During the time I was flying so low I was subjected to a lot of rifle and machine gun fire."

R.N.A.S. Raid on Hoboken and Ghistelles.

THE Admiralty issued the following announcement on September 4th :—

"On the afternoon of the 2nd inst. the shipbuilding yards of Hoboken, near Antwerp, were successfully bombarded by naval aeroplanes.

"On the 3rd inst. the enemy aerodrome at Ghistelles was also bombarded with effect by a large squadron of our machines.

"All machines returned safely in both cases."

From Other Sources.

Messages received in Paris from Salonica on August 18th state :—

"Some enemy airmen attempted a bombardment of our positions at Ostiovo, but fled before our artillery fire."

Mr. W. Beach Thomas, "with the British Army in the Field," writing to the *Daily Mail* on August 17th, says :—

"The Germans are good enough to say that the offensive is over. That is why, perhaps, they continue to move up new batteries and are urging their aircraft to braver flight.

"To-day our anti-aircraft guns shot down two enemy planes in the neighbourhood of Ovillers, of which one lay flaming close to our lines ; and the episode is a sign of the times. I doubt whether our 'Archies,' whose later powers is much under-rated, have ever had more victims or so successfully driven the enemy to extreme heights.

"The sudden deluges of rain which have fallen to-day have vitally altered the fighting, both in the air and on the ground. The aeroplanes have been driven down, and many of the shell-holes to which the enemy has been driven for refuge by the shelling of their trenches are become ponds or bogs. Did ever the rainbow, that symbol of protective goodness, ever bridge a grimmer battlefield ? I see it as I write, resting as it seems to the right on Guillemont, to the left on Pozières."

The *Times* correspondent with the Serbian Army, on August 18th, writes :—

"In the course of the day 19 Serbian aeroplanes visited Monastir and dropped some 90 bombs on the Bulgarian aerodrome in that town with excellent effect.

"In the morning a flotilla of enemy aeroplanes flew over Vertekop, near Vodena, bombing the British ambulances attached to the Serbian Army, and wounding six persons."

The *Daily Telegraph's* correspondent in Paris, writing on August 20th, says :—

"Second Lieut. Guynemer brought down his thirteenth enemy aeroplane on Thursday and his fourteenth on Friday. He is just 20, and was unknown as an aviator before the war. He soon, however, so to speak, won his spurs, was promoted Sergt., then Second Lieutenant, and won successively the Military Medal, the Legion of Honour, and the Military Cross. He was once slightly wounded, but that incapacitated him only for a few weeks.

"The honours list of French aviators whose names have so far been revealed by General Headquarters are Second Lieuts. Guynemer, 14 enemy aeroplanes; Navarre, 12; Nungesser, 10 and 2 'sausages'; Chainat, 8 and 1 'sausage'; Chaput, 8; Lenoir, 7; Haurtaux, 5; and Sergt. de Rothefort, 5.

"Second Lieut. Haurtaux has just been named for the first time. He belongs to the flight squadron called the 'Storks,' which Capt. B. commands, and which boasts a total bag of 40 enemy aeroplanes, viz., Capt. B., 4; Lieut. D. and Sergt.-Major G., 4 each; Lieut. de L., 3; Second Lieut. Chainat, 8; and Haurtaux, 5, the remainder of a total bag of 40 secured by men in the squadron who have since lost their lives."

Mr. W. Beach Thomas, writing to the *Daily Mail* on August 20th, states:—

"Another incident that put the men in high fettle was the fall of a German aeroplane. Apparently the pilot, who circled round courageously enough, wished to pick up the signals sent by our advancing troops in the wood, and, perhaps, attempted to send false signals to our guns. But he flew just too low. As he crossed the line one half round of shots from a Lewis gun finished his course. A little flash of fire was seen on the plane. It shook, appeared to make a back somersault, then tilted as violently forward, crumpled up and crashed on to the German line in High Wood. It is a curious coincidence that the troops in this attack have seen three similar instances, one each time they have gone over the parapet."

The *Times* correspondent at Salonica on August 20th writes:—

"British seaplanes yesterday bombarded with success a column of the enemy marching east of Kavala."

The Russian correspondent of the *Petit Parisien*, after a visit to the fighting line, says:—

"That the Germans are evidently uneasy is proved by the activity of their aircraft, which are dropping bombs on the railroad every day.

"A Russian flying captain on a Nieuport pursuing machine has in three days brought down three enemy aircraft behind the lines of Baranovitch."

Mr. Philip Gibbs, the *Daily Telegraph* correspondent with the British Armies in the Field, writing on August 23rd, says:—

"Acting in combination with our aviators, who are always observing from high places, our gunners are punishing the enemy in a very frightful way, and the ground above Thiepval and Courcelette, into which I looked for the first time at close range from the switch trench, and Martinpuich, and the barren ground to the right of it, is swept by our shell fire . . .

"From another man, in the 3rd Battalion of the 124th Regiment, there is a letter which pays a doleful tribute to our flying men:—

"'I am on sentry duty, and it is a very hard job, for I dare not move. Overhead are the English airmen and in front of us the English observers with telescopes, and as soon as they perceive anything 24 "cigars" arrive at once, and larger than one cares to see—you understand what I mean. The country round me looks frightful.'"

Mr. Beach Thomas, in a message to the *Daily Mail* on the same date, writes:—

"In watching the British attack up the hill towards Thiepval, and among trenches as tangled as the pattern of a quick hedge in winter, I saw, but nearly missed, a spectacular detail full both of beauty and meaning. Lifting my eyes a moment from the battle among the ditches, I caught sight of one of our aeroplanes. It served as a pointer to another and then another until the sky seemed full of them, all quite inaudible through the noise of the guns. Some were high, some comparatively low. No German gun could shoot without drawing their eagle eye to it, and no German plane come near to return the compliment, to spy upon our fire. I believe our artillery hit over a score of enemy emplacements this day; but I know that not from the information of my eyes.

"What happened in the air above me was this. These circling eagles of ours saw one German plane, greatly daring, though skied inconceivably high, making towards our line. In a moment their dilettante circling ceased, and the flock steered a straight course for the enemy. 'Up and at 'em' is at least as true of the British airman as of the British soldier. 'Down and away' was the only possible answer of the German; and he took his only alternative with admirable celerity.

"Our airmen always thus gather to a battle. They have strange experiences. Again and again as when the storm breaks they see the thunderbolt. Our great howitzer shells at the top of their flight are perfectly visible, and even give the impression of not travelling at any inordinate speed. As the war goes on many airmen find that they see a score of things previously invisible. They know what to look for; and perhaps they become attuned to what they work in, gaining a technical as well as a spacious vision. How much their universal presence, their eyes as well as their missiles, have affected the enemy's emotions we know from many letters and other evidence.

"So even in a close and local attack on trenches the airmen play their part and make beneficent journeys over the infantry, but one hardly heeds them."

The *Times* correspondent with the Serbian Army, writing from Salonica on August 21st, notes:—

"An enemy aeroplane was brought down by a Serbian pilot on the Moglena front, the machine falling behind the enemy's lines."

The *Times* correspondent at the British Headquarters, writing on August 21st, said:—

"Up to the very limits the weather makes possible, our airmen continue their gallant and successful work. Most eloquent on this subject is an extract from a letter written by and captured on a prisoner:—

"' . . . Each of us crouches in a little hole that he has dug out for himself as a protection against possible splinters, and stares at nothing but the sky and the black wall of the trench, . . . and the airmen circle over us and try to do some damage, but only enemy ones, for a German airman will not dare to come here—far too much afraid—only behind the front a great crowd, and here not one makes an appearance.'

"Another prisoner, a well-educated man, discussed our air supremacy freely, maintaining that it was not owing to any inferiority in the German machines or men, but only to the great extent of front which they had to cover, both in the East and West, while machines had also to be sent to the Balkans and to assist the Turks.

"Eloquent, again, is one of our own reports upon the subject: 'Fifteen indecisive combats took place, but the hostile machines for the most part descended as soon as engaged.' And this experience occurs again and again. The German tactics, indeed, are very different from the days in which they used to sail in the upper air, to wait for our men and attack them from above as they came over. Now the enemy, still keeping well on his side of the lines, tries to do what observation he does from low altitudes from which he can quickly get down to the ground.

"As for the fruits of the bravery of our men, they are simply incalculable. There is never a day of good visibility, when, helped by aeroplane observation, our guns do not make a greater or smaller number of direct hits on enemy batteries and destroy and blow up ammunition pits. Again and again, also, the air observation has guided them to break up counter-attacks which might otherwise have been serious and to find and scatter columns of men or transport on the road.

"In addition to all this is the immense damage which the airmen themselves do with their bombs to points behind the line far into enemy territory. Railway lines, railheads and stations, aerodromes, depôts, factories engaged in war manufactures, and all similar points which have a direct military use, are our chief objectives. The testimony of many prisoners agrees as to the enormous demoralisation caused by these attacks and the great hindrance to the enemy's troop movements and concentrations of material behind his lines. When this war is over historians will have no more interesting theme than the share which our aviators bore in the winning of it.

Mr. G. Ward Price, writing to the *Daily Telegraph* from Salonica on August 22nd, says :—

" Our seaplanes have played a certain part in hindering the Bulgarian advance. They bombed a marching column of the enemy near Kavala, and blew up a pontoon bridge at Kutchuk-Osmanli, over the Mesta River."

Lieut. Rene Puaux, in an article on the military situation, says :—

" It is evident that the Anglo-French aviation service will not permit German trains to come and go with that regularity which is indispensable in order to allow evacuations, not only of the troops, but also of the enormous material accumulated in the last two years."

The *Daily Telegraph* correspondent with the British Armies in the Field, in a message dated Saturday, writes in regard to the attack on Thiepval at the end of last week :—

" It is obvious that the German Headquarters Staff realises the gravity of the position. . . . Fresh troops or old troops are food for our guns, greedy for them. It is only by guns that the enemy can fight against guns, and he is drifting down batteries into a great concentration for the defence of Thiepval. . . . Meanwhile, we have in this sector, beyond any shadow of doubt or exaggeration, the mastery of the air, and that is of supreme advantage to our gunners, and to the infantry who are supported by them."

The *Morning Post* correspondent with the British Army, writing on August 25th with regard to the attacks on Thiepval, states :—

" All the time the guns kept up their terrific din. The Germans lost no time in putting up a barrage on our front line trenches and in other places. It is one of their disadvantages that they have no aerial observation to speak of and must be mainly dependent on what their infantry observers tell them. On the other hand, I witnessed the heroic spectacle of half-a-dozen of our own aeroplane observers wheeling and circling all over and round the battlefield, so that they could constantly send back news to our artillery. From time to time they flew very low, and the little smoke clouds from German anti-aircraft guns burst all round them ; but not one was brought to the ground."

Mr. G. Ward Price, writing from Salonica to the *Daily Telegraph* on August 28th regarding the bombardment of the Kavala forts, says that an aeroplane controlled the fire of the ships. He goes on :—

" The enemy's reply to the bombardment was to send three aeroplanes over Kavala Harbour, where the three monitors were lying, also a number of Greek ships, which had been permitted to enter the port, bringing food for the inhabitants of the town. The aeroplanes dropped five bombs, which fell in the water, and two others, of which one dropped in the garden of a notorious local pro-German, while the second did not explode."

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FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

STRAIGHTS with instructors last week : Messrs. Culver, Meering, Saunders, Styles and Zambournis. Circuits with instructors : Messrs. Edwards and Lyles. Eights with instructors : Messrs. Cockell, Fisher, Jamie, Keymer, Mills, Shadwell and Soden. Eights alone : Mr. Ormerod.

Brevets taken during week by Messrs. Duncan, Kay and Ward.

Instructors : Messrs. Manton, Winter, Pashley, Biard and Hale.

Beatty School, Hendon.

THE following pupils were out during last week : Mrs. Wilkinson, Messrs. Owen, Hathaway, Bruce, Stewardson, Birks, Bradley, Cowan, Wood, de Wilde, Gadsden, Bailey, Webb, Richards, Goodman, D. C. Squires and Allen.

The instructors were Messrs. G. W. Beatty, G. Virgilio, L. L. King, A. E. Mitchell and H. Fawcett ; the machines in use being Beatty-Wright dual-control and single-seater propeller biplanes, and Caudron dual-control and single-seater tractor biplanes.

Mr. B. J. E. Curry took his certificate on August 30th on a Caudron machine.

London and Provincial School, Hendon.

PUPILS doing straights last week : Messrs. Quayle, Egerton, Lewis, Davy and Sellars. Doing circuits and eights : Messrs. Sellars, Birkin and Dunnett.

Instructors : Messrs. W. T. Warren, M. G. Smiles, W. T. Warren, Jun., and P. G. Allen.

Royal Aero Club certificate taken by Mr. L. E. Dunnett.

Bournemouth School.

PUPILS rolling alone last week : Messrs. Ross, Wingfield, Montgomery, Holland, Constant, Davies and Burry. Doing straights alone : Messrs. Adamson, Brandon, J. B. Smith and Wilmott. Half circuits alone : Messrs. Hammersley, Hinchliff and Fenn. Figures of eight or circuits alone : Messrs. Daniel, Pritt and H. Smith.

Instructors : Messrs. S. Summerfield and E. Brynildsen.

35, 45 and 60 h.p. Caudrons in use.

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A Denial from Berlin.

A CONTRADICTION, only semi-official by the way, has been sent out from Berlin to the statement recently made by Major Baird that 35 Zeppelins had been destroyed by the Allies. The message adds that Germany has only lost about a fourth of that number.

For Machine Tools.

MAKERS of machine tools are giving more and more attention to the requirements of the aircraft industry. In this connection it may be noted that Messrs. Henry J. Brewster and Co., of 11, Queen Victoria Street, E.C., among other tools, are producing a surface grinding machine which well merits investigation by aircraft works managers. The working surface is 18 by 6 ins. by 9½ ins. high, while the table over all is 46 by 6 ins. It is fitted with automatic longitudinal and traverse movement, with automatic stop for throwing out feed to any desired point. An important consideration is that the firm can give prompt delivery.

The Young Stamping Machine.

WITH regard to this useful device for stamping test marks, &c., on small parts and fittings, we understand that the makers, the Blackburn Motor and Aeroplane Co., have granted the selling agency to the Aircraft Supplies Co., 17, John Street, Theobald's Road, London, W.C.

Alexander Developments.

THE G. H. Alexander Engineering Co., Ltd., who are successors to Mr. George H. Alexander, of Coleshill Street, Birmingham, the well-known maker of Alexander automatic machine tools, will shortly be installed in their extensive new works at Oldbury

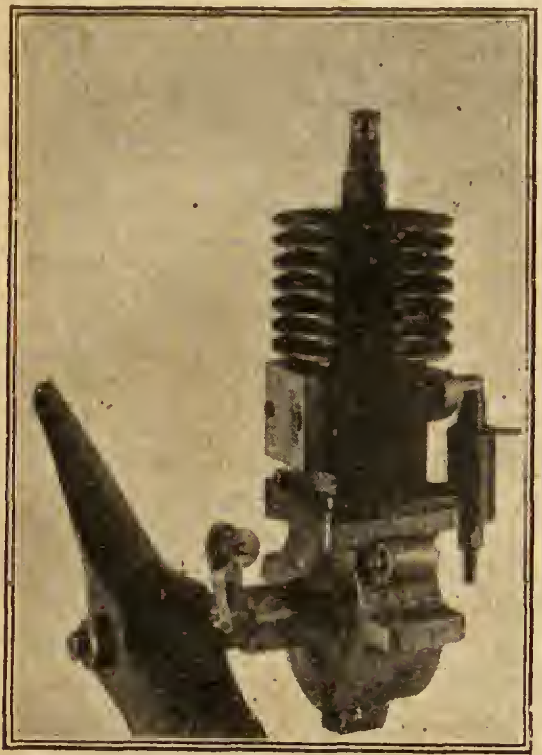
" Croid " Liquid Glue.

NOTHING succeeds like success, and it is gratifying to hear that the demand for " Croid " liquid glue continues to grow. Although this glue has made its name chiefly in connection with the building up of propellers, there are infinite uses to which it can be put, and the makers, the Improved Liquid Glues Co., Ltd., Great Hermitage Street, E., supply it in various grades to suit different requirements.

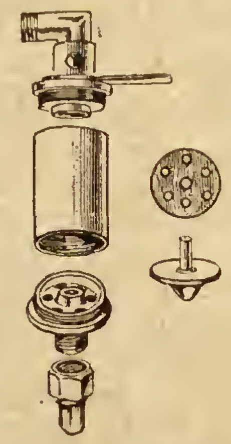
For Small Fittings.

ALTHOUGH during the past few months the aircraft industry has expanded enormously, there is still plenty of room for enterprising newcomers. In this connection, the latest addition is, however, not exactly a newcomer, for Mr. William Moss, who, having severed his connection with Messrs. Whiteman and Ross, is starting business on his own account, has been specialising in " bits and pieces " for the past eight years or so. At his new headquarters, 52, High Street, New Oxford Street, W.C., facing Tottenham Court Road, Mr. William Moss will specialise in small fittings, such as wire, copper ferrules, strainers, eyebolts, washers, thimbles, &c. He knows his business and the requirements of the industry, and he has selected a very accessible centre for attracting custom.

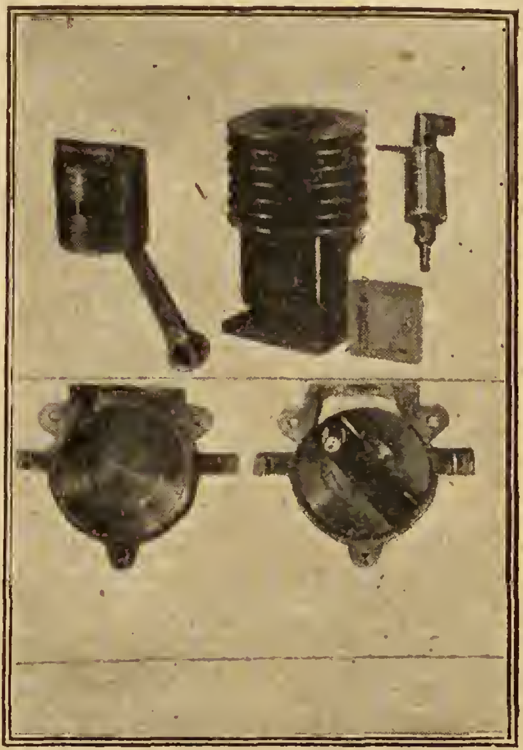
A PETROL ENGINE FOR MODELS.



The Sharp two-stroke petrol engine for model aeroplanes.



Sketch showing the component parts of the carburettor on the Sharp petrol engine for model aeroplanes.



The component parts of the Sharp two-stroke petrol engine for model aeroplanes.

THERE is little doubt that there is a great deal to be learnt from large-sized scale model aeroplanes. The question of the power plant, however, unfortunately presents a serious obstruction to experiments of this kind. Rubber motors are, of course, out of the question when one is dealing with large-sized models, not only on account of the excessive weight for power given, but owing to the space required for the length of the rubber strands it is not possible to adhere sufficiently to the conditions obtaining in the full-sized machine. Steam, CO_2, and compressed air plants have been used with more success, but even here departures from actual practice arise. With the small petrol engine, however, one approaches nearer the "real thing," but obstacles present themselves in the way of the successful running of the engine.

Taking it on the whole these small petrol engines have not proved very reliable, and the power given for the weight has been rather disappointing. One of the latest model engines to be turned out which we have had the opportunity of inspecting and testing, however, gives promise of success. This little engine, which is shown in the accompanying illustrations, has been put on the market by Messrs. A. W. Gamage, Ltd., of Holborn, London, E.C., and has been designed and built by Mr. F. N. Sharp, who has done much experimenting with model engines. It is a single-cylinder two-stroke engine having a bore and stroke of 1⅛ ins. The usual two-cycle principle is employed, viz.:—the mixture is drawn into the crankcase on the up-stroke of the piston, compressed on the down-stroke and admitted to the cylinder through ports which are uncovered by the piston at the bottom of its stroke. The exhaust gases escape through ports in the cylinder wall directly opposite the inlet ports. The cylinder is cast iron, cast in one piece with large sized cooling fins, and the sparking plug is located in the head. Cast iron is also used for the piston, which has two compression rings, and a baffle plate on the top to deflect the incoming mixture upwards and prevent it from going straight across to and out through the exhaust ports. The connecting rod, which is gun-metal, is mounted in the piston by means of a fork, carrying the wrist pin, which is screwed into the piston head. The crankshaft is of the single bearing type, balanced, and the aluminium crankcase is vertically divided. The make-and-break for the ignition is mounted on the propeller, timing being effected by adjusting the position of the contact blade, which is held by a sleeve mounted on the end of the crankcase. Petrol flows by gravity to the very simple carburettor shown in the accompanying sketch. Lubrication is also a simple matter. A little oil is put into the crankcase now and again, and as soon as the motor is started a little oil may be squirted through the air intake of the carburettor. This little engine runs very smoothly and regularly, and appears to develop quite a lot of power. When we had it under test it ran at 1,800 r.p.m. for periods of about 5 to 7 minutes—as long a duration as would ever be required for model aeroplane experiments. At the end of each run the engine was not unduly hot. The weight of the engine, with carburettor, sparking plug, and propeller is 1 lb. 15 oz.

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THE PUBLISHERS.

EDITORIAL COMMENT.

British Air Supremacy.

ANY unbeliever in the reality of the command of the air being in the hands of Britain and her Allies, must indeed be despaired of, after the daily records of the wonderful work of our pilots which are issued officially, combined with the unstinted pæans of praise emanating from every imaginable source upon this and the other side of the world. Last week once again Mr. H. G. Wells repeated his admiration of the Allies' air-work, at the same time that he entered the lists with General Brussiloff as prophet as to the duration of the war, Mr. Wells putting it at June next year—the Germans are to begin to squeal in November—and the General pinning his faith to August. And it is in a large measure the work in the air which encourages Mr. Wells to the earlier date. His reasons for this conviction are set out as follows :—

"I think so for a hundred reasons, but above all for these : The marvellous organisation of the French front, the mastery of the air which is assured to our aviators—I was witness of it, and I should rather say the exclusive possession of the air.

"Then the photographic marking by aeroplanes, in which the French take first rank. Lastly by your artillery fire, which demolishes methodically and mathematically the enemy batteries without fear of reprisals."

General Brussiloff is hardly so explicit, but then it would scarcely be politic for him to detail the reasons for his optimism as to August.

A much more elaborate and reasoned communication upon the same subject has just come to hand from the well-known correspondent of the *Chicago Daily News*, Mr. Edward Price Bell. In this he discloses a few facts of paramount interest which, although without any direct influence upon the war, would scarcely, except by running considerable risk of incurring dire penalties under the Defence of the Realm Act, be permitted to a British journalist. Mr. Bell opens with : "London miracles ? Of course they never happen. But so rapid and extensive has been the expansion of Britain's military air service during the war that it suggests the miraculous. In the matter, indeed, there was a magician's wand; it was the wand of money and skill and labour. Men have had not only money, not only skill, but the will to work to the verge of exhaustion."

Here is, indeed, an acknowledgment from an outside critic of the magnificent all-round efforts which have characterised every factory undertaking aircraft work since the first day of hostilities. It is a tribute to the patriotic energy of master and man—not forgetting that the great factor "woman" is included in "man"—alike which has been such an outstanding feature throughout the entire industry.

Following his general praise, he proceeds to summarise our military progress from the very small beginnings. At the outbreak of war, he says, Britain's total fighting strength in the air consisted of six squadrons of active aeroplanes—80 in number—manned approximately by 250 officers and 1,000 men. To-day Britain counts her air squadrons by tens, her officers of the Royal Flying Corps by hundreds, her machines by thousands, and her air-mechanics by tens of thousands. Before the war the military wing of the aerial fighting forces of Britain regarded itself as fortunate if it obtained for its purpose an appropriation of £1,000,000. At the present the annual expenditure on the Flying Corps mounts into many millions of pounds. It is probable that the country's total investment in military aircraft is not short of some £38,000,000 or £40,000,000. It may be very considerably more. In August, 1914, the Royal Flying Corps found an adequate home in six or seven rooms in the War Office building in Whitehall. The service was controlled by what was called the Military Aeronautics Directorate. At the head of this was the Director, a Brigadier-General, who had a small staff. The rooms for officer occupancy were three or four, and those for the clerical staff two or three. Now the Royal Flying Corps occupies an immense building of its own, formerly De Keyser's Royal Hotel, Blackfriars. This structure contains 375 rooms, and the corps continues rapidly to grow.

Next, the authorities having in the earliest days realised what an extraordinary part the aeroplane was to play in the war, Mr. Bell continues that they instantly braced themselves for a great effort. They needed officers and men and many more machines. Without a day's loss of time the authorities decided upon an immediate 500 per cent. expansion. Aerodromes were dotted all over England and Scotland, located in large flat expanses without high objects. such as trees, chimneys, and telegraph poles. Here the officers and men get their training. At these aerodromes the British have developed the officer and mechanical talent now fighting and maintaining British aeroplanes in Flanders, France, Egypt, Salonica, Mesopotamia, India, and East Africa. Among scouting and observing agencies the aeroplane has undisputed primacy. It ascertains not only the movements but the intentions of the enemy.

At present the Royal Flying Corps, in its magnificent building on the Victoria Embankment, is organised under a director-general, with two directors. One of its functions is described as that of "air organisation," and the other as that of "aircraft equipment." The Air Organisation Department is the super-brain—the creative brain—of the corps. It decides upon matters of policy, strategy, tactics, and the general design of aeroplanes. The Aircraft Equipment Department has control of the material supplied to it following policy decisions by the Air Organisation. The corps has sub-departments—for example, a large contract department, a works department, an inspection department. From top to bottom the Royal Flying Corps is manned by Britons, home or Colonial.

Mr. Bell then quotes an R.F.C. officer as authority in regard to the temporary hold which the Germans obtained in the air, and the almost immediate loss again of that command, through our irresistible efforts to become top dog once more and remain so, as we have, ever since. This same officer puts the reason for our position of ascendancy as follows:—

"Man for man, we undoubtedly are masters of the air on the West front. This fact I attribute to the mental and physical training we give our boys in England. Our youngest pilots have done wonderfully well. They learn quickly, are intensely keen, have great alertness of mind, act instinctively. We have found almost universally that men approaching 40, unless exceptions, have about reached the age limit for this business."

In conclusion the correspondent states that the British flying man is in the air every day between four and eight hours, constantly under fire. Ordinarily along the British front the flying men are in the air from two to three hours each day.

The author hits upon the basic reason for our superiority when he points out that our officers are always hunting for trouble above the German lines, never declining a combat, and fighting, however outnumbered. Altogether he calculates that up to the present British flying men on the Western front must have flown, entirely over the enemy's lines, much more than a million miles.

All this is very gratifying hearing from so unbiassed a source, and as there is much that we are not permitted to set out first hand, we have taken this opportunity of passing on to our readers the views of one more fortunately placed. Some day, no doubt, we may ourselves obtain opportunity for submitting a few facts without the intervention of an intermediary.

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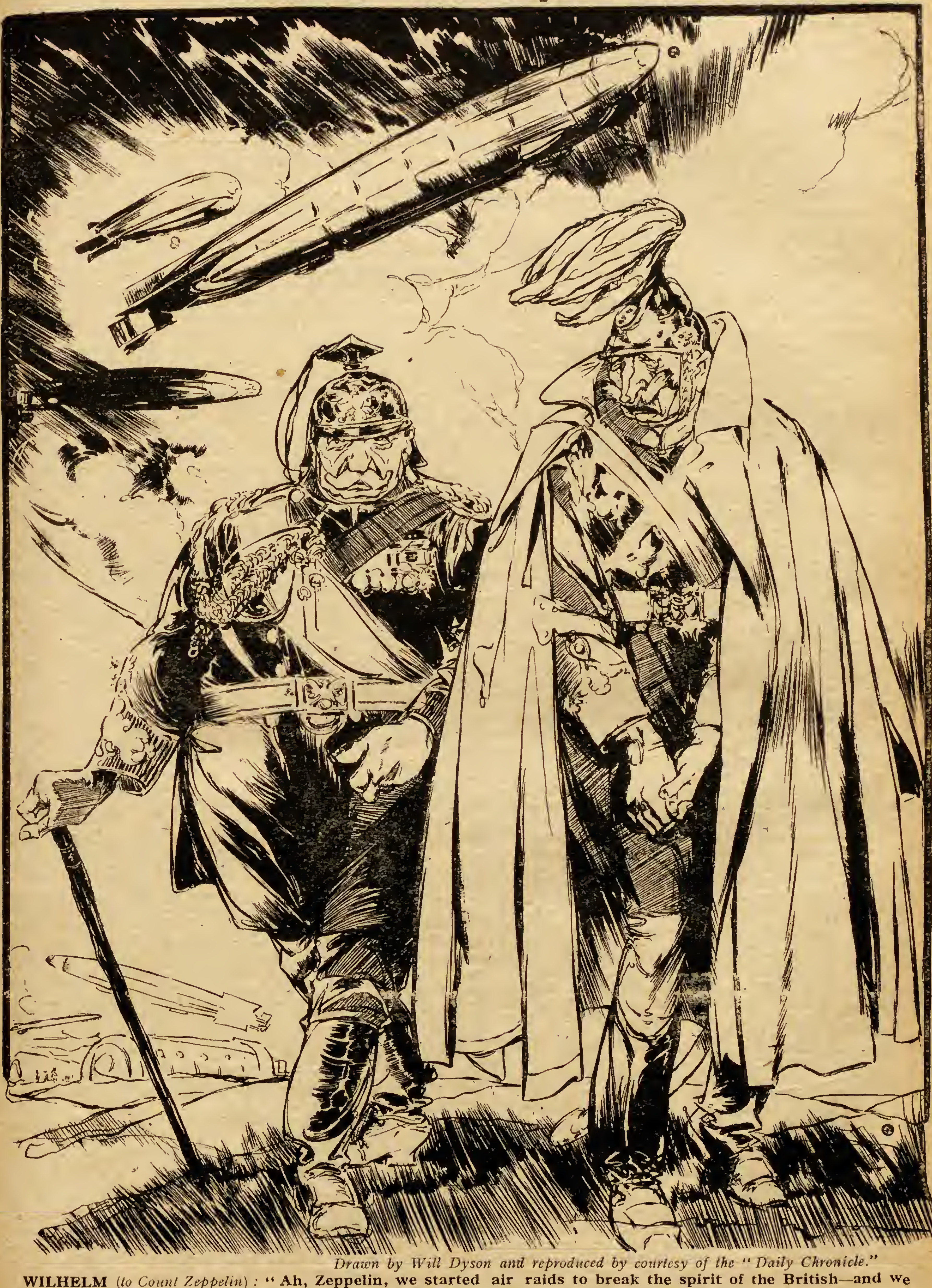
Mr. Churchill and the Hornets.

SPEAKING at Chelmsford last Saturday, Mr. Winston Churchill, after dealing with the Navy and the Army, said:—

"Then there is the air. And there, too, we have reason to be satisfied and proud. The reports from the Front are unanimous in testifying to the superiority which our airmen have obtained over the enemy in the field of battle. We cannot but be struck by the fact that we are getting a greater mastery of the problem of dealing with the German airships than we have ever had before. We cannot but be struck by the fact that the hornets are learning to fight by night as well as by day; and you will wish me in your name to express the congratulations which we all feel, the pride we all feel, in that supreme act of new prowess of a single man, by which the young officer the other night sent to its doom one of these accursed engines of destruction."

Air Raids and Expectations.



Drawn by Will Dyson and reproduced by courtesy of the "Daily Chronicle."

WILHELM *(to Count Zeppelin)* : **"Ah, Zeppelin, we started air raids to break the spirit of the British—and we have to continue them to keep up the spirit of the Germans!"**

The British Air Service

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared among the Admiralty announcements of September 5th :—

The under-mentioned have been entered as Probationary Flight Sub-Lieutenants (Temporary), seniority as follows, and all appointed to "President," additional for R.N.A.S. : H. H. Booth, Aug. 8th ; N. H. Woodhead and C. H. Pownall ; Sept. 10th.

The following appeared among the Admiralty announcements of September 6th :—

Sub-Lieutenant (Temporary) : H. F. Stackard (R.N.V.R.) entered as Probationary Flight Officer (Temporary), seniority Sept. 10th, and appointed to "President," additional, for R.N.A.S. The under-mentioned have been entered as Probationary Flight Officers (Temporary), seniority Sept. 10th and all appointed to "President," additional, for R.N.A.S. : F. Blackburn, R. H. Catleugh, L. C. Beaver, J. B. Holden, R. H. Seed, C. L. Young, A. F. Cressall, M. W. W. Eppstein, L. C. G. M. le Champion, and F. H. Pratchett.

The following appeared among the Admiralty announcements of September 8th :—

Temporary Sub-Lieut. (R.N.V.R.) W. R. D. Acland entered as Probationary Flight Officer for temporary service and appointed to the "President," additional, for R.N.A.S., to date Sept. 10th ; also C. M. R. Prewett, to date Sept. 17th.

The following have been granted temporary commissions as Sub-Lieutenants (R.N.V.R.), and appointed to the "President," additional, for R.N.A.S., all to date Sept. 7th : J. T. Matthews, R. Hollis and W. B. Daniels.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of September 5th :—

Deputy Assistant Director of Aviation.—Major N. D. K. MacEwen, Arg. and Suth'd Highrs., vice Capt. P. W. L. Broke-Smith, R.E. ; Aug. 16th, 1916.

Flight-Commanders.—Capt. R. W. Bruce, Canadian General List, from a Balloon Officer ; Aug. 8th, 1916. Temporary Lieut. E. B. Cowell, General List, from a Balloon Officer, and to be Temporary Captain whilst so employed ; Aug. 20th, 1916. Lieut. (Temporary Capt.) C. H. Pixton, Special Reserve, from a Flying Officer, and to retain his temporary rank whilst so employed ; Aug. 23rd, 1916. Capt. A. C. Bolton, R. Sc. Fus., from a Flying Officer ; Aug. 24th, 1916.

Flying Officers.—Aug. 12th, 1916 : Temporary Lieut. H. V. Stammers, General List, from a Flying Officer (Observer) ; Lieut. A. F. Baker, D. of Corn. L.I., Special Reserve, from a Flying Officer (Observer) ; Lieut. D. R. Gawler, R. Scots, Special Reserve, and to be seconded ; Lieut. G. A. Thompson, Canadian Local Forces ; Second Lieut. (Temporary Lieut.) H. Hemming, Worc. R, to relinquish his temporary rank and to be seconded ; Temporary Second Lieut. H. A. Arbuthnot, 11th Res. Regt. of Cav., and to be transferred to the General List ; Second Lieut. A. N. Benge, Special Reserve ; Temporary Second Lieut. L. E. J. Lonnen, General List ; Second Lieut. F. G. Garratt, Special Reserve. Aug. 13th, 1916 : Temporary Second Lieut. H. F. C. Cannell, R.E., and to be transferred to the General List ; Second Lieut. G. T. R. Hill, Special Reserve.

Flying Officers (Observers).—Temporary Lieut. A. N. Solly, Manch. R., and to be transferred to the General List ; July 27th, 1916. Temporary Second Lieut. H. F. Alton, General List ; Aug. 17th, 1916.

Assistant Equipment Officers.—Second Lieutenants, Special Reserve : A. L. Butcher ; July 16th, 1916. A. K. H. Maitland ; Aug. 7th, 1916. F. E. Pike ; Aug. 8th, 1916.

Memoranda.—To be Temporary Lieutenants whilst serving with R.F.C. :—Aug. 1st, 1916 : Second Lieutenants : K. L. Gopsill, E. Surr. R., Supplementary List, Special Reserve ; F. R. Hardie, 3rd Hrs. ; D. S. Cairnes, Rif. Brig. ; R. J. Lowcock, Notts and Derby R. ; A. Burbury, Yorks R. ; and F. D. Pemberton, R.A. Second Lieutenants, Special Reserve : B. B. Toms, R. War. R. ; T. Q. Studd, Devon R. ; E. C. Colman, Wilts R. ; and K. J. B. Munro, Devon R. Second Lieutenants (on probation), Special Reserve : A. H. Gibson, Essex R. ; G. Leckie, R.G.A. ; and L. D. Baker, R. Dub. Fus. Temporary Second Lieutenants : R. Addenbrooke-Prout, R.A. ; W. P. M. Newman, R.A. ; and T. McK. Hughes, K. R. Rif. C. Temporary Second Lieutenants, General List : L. C. Drenon, J. R. Allan and G. E. L. Woodhouse. Temporary Second Lieutenants, and to be transferred to General List : W. G. Warn, R. Suss. R. ; F. T. Bridger, K. O. Sco. Bord. ; H. S. Paynter, E. Surr R. ; H. C. Mulock, S. Staff. R. ; C. A. F. Brown, W. York. R. ; J. P. Colin, Midd'x R. ; and R. A. Cresswell, Oxf. and Bucks L.I.

To be Temporary Second Lieutenants for duty with R.F.C.: Aug. 15th, 1916 : Corpl. E. C. Goldsworthy, from P.P.C.L.I. ; Pte. C. R. H. Trevor, from Inns of Court O.T.C. ; Pte. J. J. Paine, from Inns of Court O.T.C. ; Pte. W. Selwyn, from Inns of Court O.T.C. ; Aug. 19th, 1916. Sergt. H. P. Solomon, from New Zealand Exp. Force ; and Pte. C. J. S. Dearlove, from R. Fus. ; Aug. 21st, 1916. Aug. 24th, 1916 : Sergt. J. S. Black and Sergt.-Major F. J. Martel, from Canadian Exp. Force ; and Corpl. T. B. Tully, from Inns of Court O.T.C. ; Aug. 24th, 1916. L.-Sergt. W. A. Amor, from H.A.C. (T.F.) ; Sergt. P. G. Burnes, from Inns of Court O.T.C. ; Corpl. C. H. Campbell, from Australian Imp. Force ; Pte. J. A. Davy, from Suff. Yeo. (T.F.) ; Sergt. F. Matthews, from R. Fus. ; Staff-Sergt. D. Nelson, from New Zealand Exp. Force ; Pte. H. W. Piper, from Lond. R. (T.F.) ; Corpl. S. G. Robinson, from Australian Imp. Force ; Staff-Sergt.-Major M. A. White, from New Zealand Exp. Force ; Pte. W. R. G. Wickham, from R. Fus. ; Sergt. J. E. Hunt, from New Zealand Exp. Force ; Pte. W. G. Cowie, from Inns of Court O.T.C. ; and Corpl. J. C. Cantrill, from Manch. Univ. O.T.C. ; Aug. 28th, 1916. Corpl. J. W. Van Alstyne, from Canadian Exp. Force ; Sergt. H. M. D. Walker and Corpl. C. B. Fenton, from Australian Imp. Force ; Pte. H. P. Rickard, from Canadian Exp. Force ; and Acting Corpl. W. R. K. Skinner, from R.F.C. ; Sept. 4th, 1916.

Supplementary to Regular Corps.—Lieut. L. F. Page is placed on temporary retired pay ; Sept. 6th, 1916.

Second Lieutenants (on probation) confirmed in their rank : L. L. M. Evans, H. Slingsby, A. N. Benge, F. G. Garratt, G. T. R. Hill, S. Wilkinson, A. D. Pocock, F. E. Pike, O. G. Thomas, P. M. E. Impey, E. E. Robb, H. Loeffler, W. T. Hall, G. Craig, H. E. R. Fitchat, H. R. Brutey, L. V. Hirst, W. B. Brett, E. E. E. Pope, O. Lindquist, A. L. Butcher, C. L. L. C. Brock, D. A. Macneill, J. R. Verel.

A. K. H. Maitland to be Second Lieutenant ; July 11th, 1916.

To be Second Lieutenants (on probation) :—Aug. 19th, 1916 : A. S. Turner, T. J. Owen, J. S. Brydon, W. C. Matthews. Aug. 24th, 1916 : D. F. Stiven, J. A. W. Armstrong, R. W. Callan, C. C. Gardner. Aug. 26th, 1916 : A. O. Roberts, E. D. Mackay. Aug. 28th, 1916 : A. P. F. Rhys-Davids, W. Noble, R. H. New, F. J. E. Stafford, H. L. Storrs, J. E. H. Swain, H. S. Brackenbury, R. G. Dalziel, J. D. Inglis, V. M. Bowling. Sept. 4th, 1916 : S. H. A. D'Arcy, F. J. Buckland and N. H. Mackrow.

The following appeared in a supplement to the *London Gazette* issued on September 6th :—

Flight-Commanders.—Lieut. (Temporary Capt.) C. C. Haynes, Devon R., from a Flying Officer ; Aug. 16th, 1916. (And to be Temporary Captains whilst so employed) : Temporary Lieut. (Second Lieut., Res. of Off.) Lord G. H. L. Dundas, General List, from a Flying Officer ; Aug. 17th, 1916. Second Lieut. D. Joy, Special Reserve, from a Flying Officer ; Aug. 21st, 1916. Second Lieut. G. S. Sansom, Special Reserve, from a Balloon Officer ; Aug. 22nd, 1916.

Flying Officers.—Major N. D. K. MacEwen, Arg. and Suth'd Highrs., from Adjutant, Central Flying School ; June 16th, 1916. Temporary Capt. H. E. Dixon, Midd'x R. and to be transferred to General List ; Aug. 11th, 1916. Aug. 12th, 1916 : Second Lieutenants, Special Reserve : L. V. Hirst, C. L. L. C. Brock, Temporary Second Lieut. G. Knight, General List. Second Lieutenants, Special Reserve :

J. R. Verel, D. A. Macneill, W. M. Kent, Temporary Second Lieut. H. V. Jerrard, General List; Second Lieut. (Temporary Lieut.) R. R. Money, E. York. R., from a Flying Officer (Osbserver); Second Lieut. O. G. Thomas, Special Reserve; Temporary Second Lieut. H. F. MacKain, General List; Temporary Second Lieut. K. Capel, General List; Second Lieut. W. E. Know den, Bord. R., and to be seconded; Second Lieut. H. E. R. Fitchat, Special Reserve. Aug. 13th, 1916: Capt. F. L. Tayler, 42nd Deoli R., Ind. Army; Second Lieut. J. L. Leith, Hamps. R. (T.F.); Temporary Second Lieut. G. S. Murray, R. Fus., and to be transferred to General List; Second Lieut. (on probation) H. F. Champion, Rif. Brig., Special Reserve, and to be seconded; Temporary Second Lieut. H. G. H. Stewart, General List; Second Lieut. W. T. Hall, Special Reserve; Temporary Lieut. (Second Lieut., Res. of Off.) Lord G. H. L. Dundas, General List, from a Flying Officer (Observer); Aug. 16th, 1916.

Adjutants.—Temporary Lieut. A. Murray, from a Flying Officer (Observer); June 9th, 1916. Second Lieut. R. B. C. M. T. de Poix, Norf. R. (T.F.), and to be Temporary Lieutenant whilst so employed; Aug. 9th, 1916.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: A. R. Crisp and E. C. Pashley.

To be Second Lieutenants (on probation): J. D. Coates; Aug. 14th, 1916. L. B. Blaxland; Aug. 28th, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 7th:—

The following Warrant Officers, N.C.Os. and men to be Temporary Second Lieutenants (on probation), for duty with the R.F.C.:—Aug. 8th, 1916: Sergt. J. E. Bonniksen, from R.F.C.; Corpl. L. G. Stevenson, from R.F.C.; Corpl. W. G. Morgan, from R.C.F.; Corpl. H. Howells, from R.F.C.; 1st Class Air-Mechanic J. D. H. Osborn, from R.F.C., 1st Class Air-Mechanic G. L. Eliot, from R.F.C.; 1st Class Air Mechanic H. F. N. Paull, from R.F.C. Aug. 9th, 1916: Corpl. (Motor Cyclist) B. D. Capper, from R.E. Aug. 10th, 1916: Flight-Sergt. A. Muir, from R.F.C.; 1st Class Air-Mechanic H. F. B. Bryan, from R.F.C.; 2nd Class Air-Mechanic C. H. Marchant, from R.F.C.; 2nd Class Air-Mechanic J. P. Burden, from R.F.C. Aug. 14th, 1916: Corpl. H. A. Blanchard, from R.F.C.; 1st Class Air-Mechanic L. Wigley, from R.F.C.; 1st Class Air Mechanic L. A. Goss, from R.F.C.; 1st Class Air-Mechanic C. H. C. Hawkes, from R.F.C.

Equipment Officer.—Temporary Lieut. A. J. Boulter, General List, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed; Aug. 26th, 1916.

Flying Officers.—Aug. 4th, 1916: Lieut. D. H. M. Carbery, R.A., and to be seconded; Second Lieut (Temporary Lieut.) R. H. Coles, W. Som. Yeo. (T.F.); Lieut. I. P. R. Napier, Arg. and Suth'd Highrs. (T.F.); Temporary Second Lieut. L. A. Davis, General List; Aug. 9th, 1916. Second Lieut. (on probation) F. E. Hollingsworth, Arg. and Suth'd. Highrs. Special Reserve and to be seconded; Aug. 14th, 1916. Second Lieut. C. F. Uwins, Lond. R. (T.F.); Second Lieut. (on probation) H. E. McCutcheon, Worc. R. (T.F.); and Second Lieut. (Temporary Lieut.) G. H. B. Johnson, Durh. L.I. (T.F.); Aug. 15th, 1916. Second Lieut. R. D. Herman, S. Lan. R. (T.F.); Second Lieut. J. C. Lees, R. Sco. Fus. (T.F.); Capt. P. R. Grace, Special Reserve, from an Equipment Officer; Lieut. H. Hewett, R. Berks. R., from a Flying Officer (Observer); Temporary Lieut. R. Cadman, N. Staff. R., and to be transferred to the General List; Second Lieut. L. M. Woodhouse, Essex Yeo. (T.F.); Temporary Second Lieut. C. G. H. Wadleigh, General List; and Second Lieut. H. J. Whittingham, Special Reserve; Aug. 16th, 1916. Second Lieut. J. V. Bowring, S. Lan. R., and to be seconded; Second Lieut. E. C. Pashley, Special Reserve; Second Lieut. A. R. Crisp, Special Reserve; and Temporary Second Lieut. J. H. Sayer, General List: Aug. 17th, 1916. Second Lieut. V. L. Morgan, E. Kent R. (T.F.); and Second Lieut. (on probation) F. S. Wilkins, R.G.A., Special Reserve; Aug. 18th, 1916.

WORSE THAN THE DEED ITSELF.—What a popular hero has to go through. Lieut. Robinson, V.C., after being decorated by the King at Windsor Castle on Saturday, being greeted by the Windsor townsfolk.

Flying Officers (Observers).—Aug. 23rd, 1916: Temporary Lieut. S. E. O'Hanlon, Lan. Fus., and to be transferred to the General List; Temporary Lieut. R. E. Duke, Army Cyclist Corps, and to be transferred to the General List; Lieut. J. A. G. Brewis, Durh. L.I., Special Reserve, and to be seconded; Second Lieut. E. H. Stevens, E. Lan. R., Special Reserve, and to remain seconded; Temporary Second Lieut. F. W. Rennie, General List. Aug. 24th, 1916: Capt. H. C. C. Morley, E. Kent R., and to be seconded; Second Lieut. (Temporary Lieut.) G. Nelson, Sco. Rif. (T.F.); Lieut. W. E. Harper, Duhr. L.I., Special Reserve, and to be seconded; Lieut. E. C. Kemp, York R., and to be transferred to the General List; Second Lieut. W. J. Corbishley, Lond. Div. Cyclist Co. (T.F.).

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: R. G. Heyn, T. G. Leith, C. D. Higgins and S. Chappell.

To be Second Lieutenants (on probation): C. A. D. Fisher; Aug. 12th, 1916. Aug. 14th, 1916: D. Smith, F. M. Howard, M. A. Chappell, F. E. Hobley and H. G. Welsford; Aug. 14th, 1916. A. C. Hartley; Aug. 23rd, 1916.

The following appeared in the *London Gazette* of September 8th:—

Equipment Officer.—Second Lieut. S. S. Nevill, Special Reserve, from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed; Aug. 21st, 1916.

Flying Officers.—Capt. R. G. Hopwood, Rif. Brig., and to be seconded. June 22nd, 1916: Second Lieut. R. G. Heyn, Special Reserve. Aug. 9th, 1916: Temporary Second Lieut. E. R. Mackey, General List; Aug. 12th, 1916. Aug. 13th, 1916: Second Lieut. B. N. Goudge, Leic. R., Special Reserve, and to be seconded; Temporary Second Lieut. R. E. Neve, Shrops. L.I., and to be transferred to General List. Lieut. E. B. Grenfell, D. of Corn. L.I. (T.F.); Aug. 15th, 1916. Aug. 16th, 1916: Second Lieut. (Temporary Lieut.) W. D. Miller, R.G.A. (T.F.); Second Lieutenants, Special Reserve: S. Chappell, C. Elphinstone, C. D. Higgins and B. James; Aug. 17th, 1916.

Memoranda.—The under-mentioned to be Temporary Second Lieutenants for duty with R.F.C.:—Sept. 9th, 1916: Sergt. R. Clowes, from Newcastle-under-Lyme High Sch. O.T.C.; Sergt. A. N. Kingwill, from Dulwich Coll. O.T.C.; Pte. J. Spencer, from Harrow Sch. O.T.C.; Pte. E. H. G. Sharples, from Haileybury Coll. O.T.C.

The following appeared in a supplement to the *London Gazette* issued on September 9th:—

Flight-Commanders.—From Flying Officers: Capt. P. R. Grace, Special Reserve; Aug. 17th, 1916. Aug. 25th, 1916: Capt. A. A. Walser, Lond. R. (T.F.); Second Lieut. E. M. Pollard, W. York. R. (T.F.), and to be Temporary Captain whilst so employed.

Memoranda.—The under-mentioned to be Temporary Second Lieutenants for duty with R.F.C.:—Aug. 28th, 1916: Leading Air-Mechanic L. W. Barney, from R.N.A.S.; Pte. G. P. Colin, from Lond. R. (T.F.); Cadet T. F. Phillips, from Univ. of Lond. O.T.C.; Sergt. C. Cornelius-Wheeler, from 30th Bn., Canadian Exp. Force; Sergt. W. Durrand, from 66th Bn., Canadian Exp. Force; Cadet C. R. V. Cook, from Bristol Univ. O.T.C.; Acting-Sergt. W. Mason, from Canadian Exp. Force.

Supplementary to Regular Corps.—The under-mentioned Second Lieutenants (on probation) resign their commissions:—Sept. 10th, 1916: G. K. Webb, A. B. Vallance. The under-mentioned Second Lieutenants (on probation) are confirmed in their rank: C. N. Dore, H. G. Gibbs, C. Clarke, F. C. Mears. The under-mentioned to be Second Lieutenants (on probation): A. S. F. Morris; Aug. 3rd, 1916. Aug. 14th, 1916: W. T. Curtis, C. H. Butcher, E. A. Molyneux, G. H. Warnecken, H. Willans Robinson, J. J. Lovesay, H. J. Barwick, H. B. Golding, D. L. Hollis, W. S. C. Stephens. Aug. 28th, 1916: R. Hunt, C. B. Van Leenof, A. E. Woodbridge, A. J. J. Lamb, T. L. Baylis and W. F. Simpson.

The following appeared in a supplement to the *London Gazette* issued on September 11th:—

Assistant Equipment Officers.—Second Lieut. T. Goulburn, Special Reserve; June 24th, 1916. Second Lieut. H. J. de C. Moore, Special Reserve, from a Staff-Lieut. at the War Office; August 29th, 1916.

Supplementary to Regular Corps.—Second Lieut. (on probation) K. J. Box resigns his commission; September 12th, 1916.

Second Lieuts. (on probation), confirmed in their rank: E. Laurie, E. B. Macmanus, A. T. Shaw, I. B. Hart-Davies, C. D. Bennett, F. L. Luxmoore, S. C. Maytom.

HONOURS.

Rewards for the R.N.A.S.

In a supplement to the *London Gazette* issued on September 7th, it was announced that the King has been graciously pleased to give orders for the award of the Distinguished Service Cross to the under-mentioned officers:—

Flight Sub-Lieutenant R. S. Dallas, R.N.A.S.

Flight Sub-Lieutenant Dallas, in addition to performing consistently good work in reconnaissances and fighting patrols since December, 1915, has been brought to notice by the Vice-Admiral, Dover Patrol, for the specially gallant manner in which he has carried out his duties. Amongst other exploits is the following: On May 21st, 1916, he sighted at least 12 hostile machines, which had been bombing Dunkerque. He attacked one at 7,000 ft., and then attacked a second machine close to him. After reloading, he climbed to 10,000 ft. and attacked a large hostile two-seater machine off Westende. The machine took fire, and nose-dived seawards. Another enemy machine then appeared, which he engaged and chased to the shore, but had to abandon owing to having used all his ammunition.

Sub-Lieutenant (now Acting Lieutenant) C. B. Oxley, R.N.

Sub-Lieutenant Oxley was acting as observer with Flight-Lieutenant Edward H. Dunning, D.S.C., as pilot, on escort and reconnaissance patrol for a flight of bombing machines on the Bulgarian coast, on June 20th, 1916. Two enemy machines were engaged at close range and forced to retire, and as our machine withdrew Flight-Lieutenant Dunning was hit in the left leg, and the machine itself was badly damaged. Sub-Lieutenant Oxley, having first improvised a tourniquet, which he gave to Flight-Lieutenant Dunning, took control of the machine, whilst the latter put on the tourniquet. The pilot was obliged to keep his thumb over a hole in the lower part of the petrol tank in order to keep enough fuel to return to the aerodrome, where he made an exceedingly good landing.

Flight Sub-Lieutenant D. E. Harkness, R.N.A.S.

Flight Sub-Lieutenant R. H. Collett, R.N.A.S.

In recognition of their services on the morning of August 9th, 1916, when they dropped bombs on the airship sheds at Evere and Berchem St. Agathe. Flight Sub-Lieutenant Collett dropped all his bombs on the shed at Evere from a height of between 300 and 500 ft., under very heavy rifle, machine-gun and shrapnel fire from all directions. Flight Sub-Lieutenant Harkness could not descend so low owing to the very heavy anti-aircraft fire which had by this time been opened on the machines, but he dropped some of his bombs on the shed, and then proceeded to Berchem St. Agathe, which he also bombed.

Correction.—It is officially announced that the name of Chief Petty Officer, R.N.A.S., Harry Nelson, O.N. F. 8945, which appeared in the list of men mentioned in Despatches on p. 415 of "Flight" of May 18th, 1916, should read: Chief Petty Officer Mechanic, R.N.A.S., Hugh Nelson, O.N. 272016.

A Bar to a Military Medal.

In a special supplement to the *London Gazette*, issued on September 9th, it was announced that the following officer had been awarded a Bar to his Military Cross for a subsequent act of conspicuous gallantry:—

Lieutenant (Temporary Major) Arthur Ashford Benjamin Thomson, R. War. R. and R.F.C.

For conspicuous gallantry and good work during Zeppelin raids.

(The Military Cross was awarded October 2nd, 1915.)

The announcement of the award of a second Military Cross, dated May 31st, 1916, is now cancelled.

CONSTRUCTIONAL DETAILS—XV.*

HAVING dealt, in previous instalments of our series of constructional details, with the mounting and cowling of rotary engines, both on tractors and "pushers," the next type to be studied is the radial air-cooled engine with its supports and housing. While there are several types of rotary engines in general use the radial air-cooled motor is to all intents and purposes confined to a single make of engine—the Anzani—which ever since the day when it made Mons. Blériot's famous cross-channel flight possible, has stood the test of time on all manner of machines, from the little 30 h.p. school machine to the big twin-engine "battle-plane."

The Anzani is so well known that no lengthy description of it will be necessary here; suffice it to recall the fact that it is designed to be supported by long bolts passing through the crank-case from front to back. This arrangement, which has proved entirely satisfactory in practice, has no doubt been responsible for the fact that one form of mounting has been practically universally adopted—*i.e.*, a capping plate of heavy gauge sheet steel, provided with flanges bolted to the rails of the body, has a circular opening cut in it to clear the magneto, oil pump, &c., and round this opening, and uncomfortably close to it, by the way, are holes corresponding with the long bolts passing through the crank-case. In some machines, where this mounting cantilever fashion has been thought insufficiently rigid, the front of the crank-case is supported by tubes running from the front end of the crank-case bolts to some suitable point on the machine, thus relieving the engine plate of some of the buckling strain to which the cantilever mounting subjects it. In one instance only have we been able to trace any attempt to devise a front support other than the tubes mentioned above. We are referring to the Blériot mounting of the 35 h.p. Anzani. In this a pressed steel frame of the form illustrated in our sketch of the Blériot mounting supports the front end of the propeller shaft, which runs in a ball-bearing placed in the centre of the front engine frame. From the point of view of rigidity of the mounting this method is obviously a better engineering proposition than is the usual cantilever mounting, and as regards weight it will probably be found to be as light as, if not lighter than, the single plate mounting, which must necessarily be of considerably heavier gauge than each of the two Blériot type engine plates. When the head resistance comes to be considered, however, it is obvious that this must be somewhat high in this machine.

Turning our attention to the usual mountings of the Anzani engines, a glance at the accompanying sketches will show that these are practically identical in all the examples shown, with the exception that in some instances an auxiliary support is provided in the form of tubes running back to the main framework of the body. This, it will be seen, is the case with both the Caudron machines. In the monoplane there are four of these tubes running to the top and bottom rails of the body, whereas in the biplane the upper tubes only have been retained, although further support is provided by another pair of tubes bolted at their upper ends to the leading edge of the top plane at the point where occur the inner inter-plane struts.

In the Handley-Page biplane a single tube supports the front of the engine, passing through the cowl and up to the top of the *cabane* that carries the upper plane. As mounted on the two Deperdussin monoplanes shown no forward support is employed, the entire weight of the engine being taken by the main engine bearer.

With regard to the cowling employed, if any, this is to a large extent determined by and dependent upon whether or not the particular engine is of the older type fitted with auxiliary exhaust ports in the cylinders, or of the newer type in which these ports have been dispensed with. In the former case there will obviously be a lot of oil thrown out through the auxiliary ports, which it is desirable to prevent by some form of cowling from being blown back in the pilot's face.

In the British Deperdussin Military monoplane shown in one of our sketches this purpose is served by a small aluminium shield surrounding the upper part of the engine so as to protect the pilot against at least the oil from the top cylinders. The fast little Caudron monoplane on which Mr. Ewen crossed the Channel had a very diminutive flat shield, which must have been even less effective than was that of the Deperdussin, seeing that the short exhaust pipes of the upper cylinders projected above the shield, which served only to guard against the oil splashed out through the auxiliary ports. In the little 35 h.p. Anzani engine Blériot no attempt whatever was made at reducing the bath of oil issuing from pipes and ports, as pupils learning on these machines will testify. In later Anzani models, however, the exhaust ports have disappeared, with, it is true, a slight loss in power, but with a very considerable gain in comfort. In these newer types it is usual to fit what is generally known as collector pipes, that is to say, two long curved pipes conveying the exhaust gases, which are led to them through short branch pipes from each cylinder, down below the body of the machine where they do not interfere with the pilot's vision. In the Handley-Page biplane these pipes were extended unusually far back, and terminated, as will be seen, in a silencer, the result being that at a very low altitude this machine could not be heard from the ground.

It will be easily seen that when these exhaust collector pipes are fitted no shield is necessary for the purpose of catching any oil, but it would appear that from the point of view of resistance a very considerable advantage might accrue from employing some form of aluminium nose piece that would afford a better entry for the air than does the frequently blunt nose of a machine, and the flat ribbed crank case. It should be quite possible to design such a cowl, which would round off the crank case and lower portion

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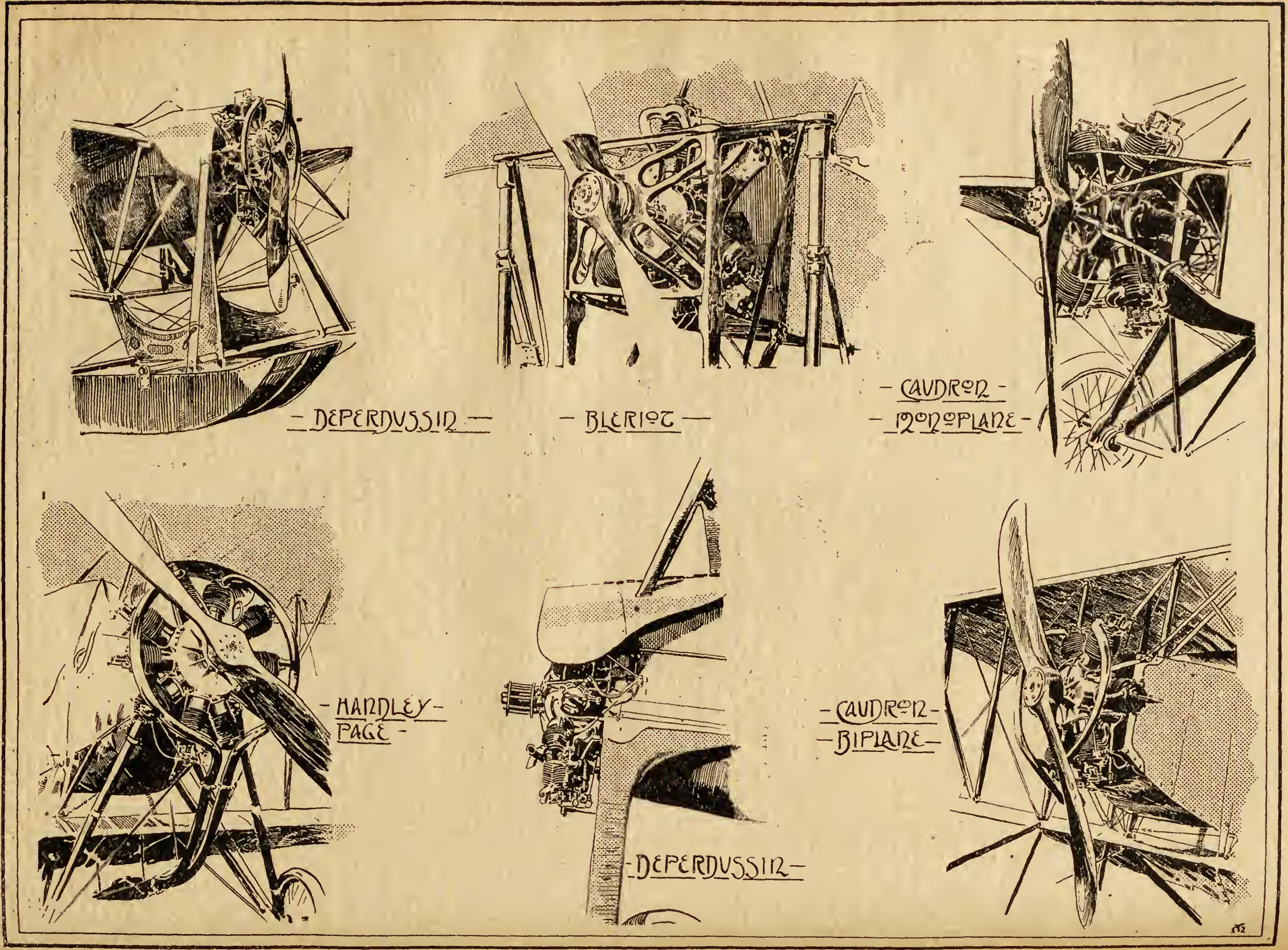
* Previous sets of sketches in this series have appeared as follows:—

Strut sockets	Sep. 10	Vee type undercarriages ..	Nov. 5
,, ,, ...	,, 17	,, ,, ,, ..	,, 12
,, ,, ...	,, 24	Wheel undercarriages	,, 19
,, connections, &c.	Oct. 1		
Wing spar sections	,, 8		1916.
Streamline struts, sections ..	,, 15	Engine mountings	Jan. 6
Double-skid undercarriages ..	,, 22	,, ,, ...	Apl. 27
Single-skid undercarriages ..	,, 29	,, ,, ...	June 8

Any of these back numbers can be obtained from "FLIGHT" Office, 44, St. Martin's Lane, price 6*d*. each, post free.

CONSTRUCTIONAL DETAILS—XV.



Different mountings and cowls of radial air-cooled engines.

of the cylinders, while leaving the finned portion of them exposed to the flow of air. In the Deperdussin seaplane the cylinders hardly project beyond the sides of the body, which would, it seems to us, mean that not only could the flow of air round the cylinders not have been so good as might have been desired for cooling purposes, but that the large normal area presented by the flat nose of the body, must have offered a very considerable amount of resistance. That this question is well worth studying is proved by the fact that in recent Anzani engines the crank case webs have been placed inside instead of outside the front cover, with the result that in a given machine the speed was increased by several m.p.h. If the mere rounding off of the nose of the crank case will do this, surely there is reason to suppose that a cowl round the entire centre part of the engine will give even better results.

THE ROLL OF HONOUR.

The Secretary of the Admiralty announces the following casualties :—

Accidentally Killed.

Squadron Com. I. H. W. S. Dalrymple-Clark, R.N.
Flight-Lieut. C. W. Graham, D.S.O., R.N.

Died.

Temp, Flight Sub-Lieut. Lewis Radmore, R.N. (Sept. 6th).

Missing.

Acting Flight-Com. G. H. Beard, D.S.C., R.N.

Slightly Injured.

Prob. Flight Sub-Lieut. J. M. Mapplebeck, R.N.
Flight Sub-Lieut. C. S. Nunn, R.N.

Previously reported Missing, now Presumed to have been Killed.

Flight-Lieut. R. G. A. Baudry, R.N.

The following casualties have been officially announced by the War Office :—

Killed.

Second Lieut. G. M. Allen, R.F.C.
Lieut. R. Burleigh, R.E. and R.F.C.

Previously reported Missing, now reported Killed.

Second Lieut. H. W. Butterworth, R.F.C.

Died of Wounds.

21289 2nd Air-Mechanic J. McCullock.

Died.

2199 Sergt. R. Ruffell, R.F.C.
4699 1st Air-Mechanic F. G. Young, R.F.C.

Wounded.

Second Lieut. G. N. Anderson, Yeo. and R.F.C.
Second Lieut. R. S. Capon, King's (Liverpool) and R.F.C.
Second Lieut. S. W. Carline, R.F.C.
Second Lieut. S. Chappell, R.F.C.
Second Lieut. A. P. V. Daly, Connaught Rangers and R.F.C.
Lieut. G. G. B. Downing, R.F.C.
Second Lieut. S. A. Gibbons, R.F.C.
Second Lieut. R. H. Johnson, R.F.A. and R.F.C.
Second Lieut. G. K. Macdonald, Sherwood For. and R.F.C.
Lieut. F. S. Rankin, Canadian Engrs., attd. R.F.C.
Second Lieut. F. W. Rennie, R.F.C.
Second Lieut. P. A. Wright, R.F.C.
9389 2nd Air-Mechanic G. M. Howell, R.F.C.

Missing.

Second Lieut. E. Burton, R.E., attd. R.F.C.
Second Lieut. D. S. Cairnes, Rif. Brig., attd. R.F.C.
Second Lieut. H. C. Evans, D.S.O., R.F.C.
Second Lieut. F. W. Griffiths, Middlesex Regt., attd. R.F.C.
Second Lieut. J. D. A. Macfil, Black Watch, attd. R.F.C.
Second Lieut. F. G. Macintosh, R.F.C.
Lieut. H. F. Mase, R.F.C.
Second Lieut. A. J. O'Byrne, King's (Liverpool), attd. R.F.C.
Lieut. V. G. Odling, R. Berks. Regt., attd. R.F.C.
Second Lieut. F. D. H. Sams, R.F.C.
Capt. H. G. Salmond, R.F.C.
Capt. A. Skinner, S. Lancs. Regt. and R.F.C.
Lieut. D. Stewart, R.G.A., attd. R.F.C.
Second Lieut. M. H. Strange, R. Fus., attd. R.F.C.
Second Lieut. K. G. Tullock, R.F.C.
Second Lieut. B. M. Wainwright, R.F.C.
Capt. O. L. Whittle, S. Lancs. Regt. and R.F.C.
Capt. R. E. Wilson, Hampshire Regt., attd. R.F.C.
934 Sergt. E. H. Dobson, R.F.C.
2260 Sergt. A. Walker, R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

Second Lieut. J. H. Firstbrook, R.F.C.
Capt. J. H. F. McEwen, Cameronians (Sco. Rif.), attd. R.F.C.

Correction :

Previously reported Missing, now reported Killed.

Second Lieut. J. L. P. Armstrong, A.S.C. and R.F.C., should read :

Previously reported Missing, now reported Died of Wounds.

Lieutenant W. L. Robinson Gets his V.C.

Lieut. W. L. Robinson was present at the Investiture at Windsor Castle on September 8th, when the King decorated him with the Victoria Cross. Lieut. Robinson was also presented to the Queen, Princess Mary and Prince Albert.

Rewards for Lieutenant Robinson, V.C.

The first of the cash rewards actually to be received by Lieut. Robinson was £500 from Mr. L. A. Oldfield. Mr. William Bow has also sent him the £500 which he offered to the first pilot to bring down a Zeppelin on British soil. It is proposed that there should be a public presentation at Newcastle of the £2,000 offered by Col. Joseph Cowen. Lord Michelham, who offered £1,000 to each of the first 10 aviators who may destroy Zeppelins, has sent that sum to the Lord Mayor to be handed over to Lieut. Robinson. Two prizes of £100 each offered by two Nottingham citizens, Mr. G. Wigley and Mr. John Ball, are also to be given to Lieut. Robinson.

The Lord Mayor of London is in communication with the War Office with regard to the bestowal of a civic honour upon Lieut. Robinson. It may be noted that the £500 originally offered by Sir Charles Cheers Wakefield has already been expended in providing gold medals, which were distributed among the 353 officers and men who were deemed to be concerned in bringing down L. 15 in the Thames Estuary.

"L. 21" Relics to be Exhibited.

An opportunity for the public to see something of what remains of the German airship destroyed at Cuffley, is shortly to be afforded in London, although the actual time and place of the exhibition has not yet been decided upon. The War Office is in communication with the Lord Mayor on the matter. It will probably be at the Guildhall or the Mansion House, and the proceeds will go to charities. The exhibition might be a fitting opportunity for the relic-finders who have not so far risen to the invitation of the W.O. to hand them over, to put them on show labelled with "Lent by ——." The W.O. could then borrow a few of those they may want.

Kut Prisoners at Baghdad.

The following message, dated Baghdad, July 23rd, has been received in London from Flight-Lieut. Cecil B. Gasson, R.N.A.S., one of the British prisoners captured by the Turks in Mesopotamia :—

"I am getting on quite well. My foot is progressing favourably. I hope to hobble in a few weeks' time. There are several of us here in an English hospital. We are very comfortable, get our pay regularly, and can buy most things in the shops. We are very well treated. Best love to all. Don't worry."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Thursday last, the 7th inst., when there were present: Professor A. K. Huntington, in the Chair; Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight-Commander C. F. Pollock, R.N., and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Second Lieut. Arthur Vivian Burbury (Yorkshire Regt.).
Flight-Lieut. William Albert Burns, R.N.
Capt. Francis Percival Don, R.F.C.
Flight Sub-Lieut. Arthur Westlake Farquhar, R.N.
Lennox Weston Glendower Forster.
William Edward Foster.
Second Lieut. Arthur Clifford Hartley, R.F.C.
Flight Sub-Lieut. Eric Perrin Hicks, R.N.
Capt. Ernest E. Hodgson, R.F.C.
Huw Conway-Jones.
Second Lieut. Roland Mann (Coldstream Guards).
Second Lieut. Richard Fitz Power, R.F.A.
Capt. Henry Sidney Lees-Smith, S.A.D.F.
Lieut. Guy Sydney Maxwell Taylor. R.E.
Lieut. Hardress Edmund Waller (2nd York and Lancaster Regt.).
Lieut. George Francis Maule Warner.
Flight-Com. Harold Edward Mostyn Watkins, R.N.
Flight-Com. Ernest Victor Samuel Wilberforce, R.N.
Capt. John Whitaker Woodhouse, R.F.C.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Sept. 5th, 1916	10,829	1	5
John Twells	1	1	0
Collected at the Westland Aircraft Works, Yeovil (Forty-seventh contribution) ..	1	2	3
Staff and Workers of Gwynnes, Ltd. (Twenty-third contribution)	8	2	8
Total, September 12th, 1916 ..	10,839	7	4

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

FLYING AT HENDON.

IDEAL weather conditions prevailed at Hendon last Saturday afternoon, and a fair number of visitors turned up to see the flying. The latter was much the same as usual—passenger flights by the Grahame-White pilots on the 80 h.p. three-seater biplane and sundry Curtiss, B.E., R.E. and Maurice Farman machines up. We noticed Capt. B. C. Hucks was flying the last-named make of machine, and it quite reminded us of old times, except that the megaphone man did not announce him by name. H. Sykes brought out the Martinsyde biplane, and with A. A. Fletcher as passenger started off for Richmond, where he was to give a looping display, as reported elsewhere. Before leaving the aerodrome Sykes gave us a farewell loop, for he is going to pitch his hangar in fields afresh, and will only be seen at Hendon in coming days as an aerial visitor. During the afternoon a Sopwith triplane came over and performed various wonderful evolutions, including some climbing loops, which bore the unmistakable trade-mark of Harry Hawker. A little later on he departed for Brooklands way, and shortly after he—or perhaps it was another pilot—paid a second visit, this time on a one-and-a-half strutter. W. T. Warren-the-Younger, at about the same time the latter machine was gamboling about, brought out a 45 h.p. L. and P. Caudron and put up a few stunts, which appeared to be quite dainty alongside those of the other. After this the various schools got going, and as there were several "pups" in the early circuit stage plenty of fun was to be enjoyed, albeit at times it was somewhat alarming. On Sunday, Saturday's dose was repeated.

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Aerial Contortions at Richmond.

WHILST a sort of garden fête, on behalf of the Richmond Boys' Naval Brigade and the Star and Garter Fund (wounded and disabled soldiers), was in progress on the old-world Richmond Green last Saturday afternoon, a biplane appeared overhead and "bombed" the merrymakers with thousands of leaflets bearing the following device:—

"Whitehead Aircraft wish every success to the Richmond Boys' Naval Brigade and to the Star and Garter Fund, Richmond. Pilot—H. Sykes. Passenger—Mr. Fletcher. Saturday, September 9th, 1916."

Then followed a series of aerial contortions that both amazed and amused. There were loops, tail-slides, nose-dives, switchbacks, and many other indescribable evolutions—in fact, H. Sykes, figuratively speaking, let himself and the machine go. He and his passenger had come from Hendon on the Martinsyde, and on the way looped over Kew Bridge and Richmond Bridge, where, needless to say, considerable excitement prevailed. At the conclusion of the demonstration the pilot made for the old Deer Park—the scene of poor Graham Gilmour's fatal accident in 1912—where a safe landing was made. A little later G. H. Stevens made a short solo flight, after which the machine was flown over to Hanworth, where it was housed.

Germans Forge *Daily Mail*.

TRAVELLERS from Brussels report that forged copies of the *Daily Mail* are being printed and circulated with the idea of spreading false news as to the condition of this country and the effect of Zeppelin raids. It represents London as being for the most part reduced to ruins. It is stated that the forgeries have been so cleverly printed that it is extremely difficult to distinguish them from the genuine article. In the meantime the *Vossische Zeitung* publishes a story to the effect that the English Press prints two editions, one containing home truths for home consumption and the other pretty stories for neutrals.

A Submarine Destroyed by Aeroplane.

INFORMATION has been received in Amsterdam that a British pilot recently destroyed a damaged submarine in Zeebrugge Harbour. The Germans fired heavily at the aeroplane, which, however, returned safely to its station at Dunkirk.

FROM THE BRITISH FLYING GROUNDS:

Grahame-White School, Hendon.

Straights with instructors last week: Messrs. Meering, Saunders, Styles and Zambournis. Circuits with instructors last week: Messrs. Culver, Cockell, Edwards, Fisher, Hodgkinson, Lyles and Mills.

Instructors: Messrs. Manton, Winter, Pashley, Hale and Biard.

Brevets during week: Messrs. Jamie, Keymer, Ormerod, Shadwell and Soden.

Hall School, Hendon.

Pupils out during last week: With Cecil M. Hill: Messrs. Orton, Cordner, Rayne, Cowell and Lieut. Malden. With Gerald Smith: Mr. Stamps; Mr. E. Hatchman extra practice. With Fred J. Glegg: Messrs. Bateman, Smith, Henley, Mayer, Barton and Packman. With Stanley G. Cownie: Messrs. Maude, Course, Yuill, Foster and Blake.

Royal Aero Club certificates were taken by Messrs. Cordner, Orton, Rayne and Stamps, all in excellent style.

Hall Government-type tractors in use.

Copyright, F. N. Birkett, from the F.N.B. Series.

A group of pupils and instructors at the Hall Flying School, Hendon.

London and Provincial School, Hendon.

Pupils doing straights, circuits and eights last week: Messrs. Sellars, Lewis and Davy.

Instructors: Messrs. W. T. Warren, M. G. Smiles, P. G. Allen and W. T. Warren, Jun.

Royal Aero Club certificates were taken this week by Messrs. A. F. Sellars, Tom Lewis and Archie Davy.

Bournemouth School.

Pupils rolling alone last week: Messrs. Burry, Allan and Ross. Doing straights alone: Messrs. Brandon, Montgomery, Holland, Davies, Constant and Wilmott. Half circuits alone: Messrs. Adamson, Hammersley, Fenn and Hinchliff. Circuits and figures of eight alone: Messrs. Daniel and H. Smith.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

35, 45 and 60 h.p. Caudrons in use.

* * *

3rd Class Air-Mechanics, R.F.C.

In an Army Order issued on September 6th, it is announced that all recruits taken for the Royal Flying Corps who fail to pass the trade test for 2nd Class Air-Mechanics on enlistment, will be graded as 3rd Class Air-Mechanics while under training and until they qualify as 2nd Class Air-Mechanics.

Technical Quartermaster-Sergeants, R.F.C.

Another Army Order, dated September 6th, states that the rate of pay of Technical Quartermaster-Sergeants of the Royal Flying Corps appointed from August 27th is to be 8s. a day.

Military Aviation in Japan.

The estimates of the Japanese War Office for the next fiscal year include 1,000,000 yen (a little over £100,000) for the aviation corps; this is an increase of 400,000 yen compared with the current year. It is proposed to build 10 aeroplanes, put up some more sheds and lay out another aerodrome in addition to the one at Tokorozawa.

ARMCHAIR REFLECTIONS

by the Dreamer

It is proposed to erect a monument at Cuffley to mark the spot where Lieutenant Robinson brought the raider to grass. The ground has already been offered as a gift to the nation, and the granite promised.

There are those who would have our country bristling with monuments. I doubt not that when the widening of Fleet Street is completed and traffic has a chance to progress smoothly, somebody will stick a monument up in the very middle of it to commemorate the widening, even as at Temple Bar.

I have nothing in the world to say against the proposed monument except that it does not appear to be necessary ; that we have already far too many monuments ; that most of those we now have would be better removed.

By this you shall judge that I am no lover of monuments. Artistic statues are a feast of art when placed and viewed midst their proper surroundings. Portrait statues in the public streets are an abomination : as well hang the family portraits on the front railings. Who can look upon most of the portrait statues in London without feeling sorry for those they are supposed to represent ? There they stand, or sit, or loll, in their robes of office and four-and-eleven trousers, holding out a roll of paper with one hand, and holding on to the back of a chair or something with the other, for all the world like a spring poet who has gained the sanctum sanctorum disguised as subscriber.

With the erection of some suitable memorial to commemorate something of great national importance, I entirely agree, provided it be a work of art, and something worth looking at. The arch at the entrance to Constitution Hill bearing aloft that glorious creation of the sculptor's art, is magnificent. And what could be more beautiful than the Victoria memorial in the Mall ?

What annoys me is the sticking up of petty granite pillars all over the place to commemorate something or somebody which the people of a few years hence will not be interested in to the extent of asking what it is all about. London is full of old monuments with unreadable inscriptions, neglected, decaying crumbling. Monuments are raised to dead men and to living men. They spring up to commemorate great deeds, and they are placed in position as a reminder of those of another description. When I rail at the frightfulness of the Hun, I would like to forget that tablet let into the wall of the old wing of "Bart's" in Smithfield. It marks the spot where the three Johns—Rogers, Bradford and Philpot—were burned at the stake.

As a monument I can accept the Nelson Column on account of its noble proportions and its artistic aspect, but it were better to have stopped at the capitol. The figure above is to me but the effigy of a great man.

I suppose it is all very much a matter of personal feeling and opinion, and that which I see nothing in might to others be an object of merit—excepting those sprouting obelisks, of course.

I remember Cleopatra's Needle coming over in its cylindrical boat, and the anxious way I watched for its erection on the embankment, and the disappointment when I saw it. It may be that it is a very beautiful thing. I have seen people stand and gaze at it open-mouthed. So far as I feel, it might just as well never have been dug up out of its native sand, or left to rest beneath the waves of Biscay O.

The feat of Lieutenant Robinson was a great one. We were all very pleased at and very thankful for his skill in destroying the nighthawk. He has justifiably been the hero of the hour, and the cross pinned upon his breast by his King was faithfully and honestly won. We are all very proud of him, but I do not think that his deed, meritorious as it was, will go down through history except as one of many thousands of equally great deeds done during this time of trouble and bloodshed.

I have studied the portraits of a great many of the heroes who have won the coveted cross during the war. They are of all sorts and sizes. Good to look upon, and commonplace. They range from the ex-newspaper seller to those from the upper ten thousand, but they are all alike in their modesty. Having done their duty in its highest aspect, and won their honour, it is but human nature that they appreciate a little lionising; after that they prefer to slip out of the limelight. *Aura popularis* is short lived, and has no solidity. It is but an edifice with foundations of sand. A day, or an hour, and we are whisked off into fresh channels. Of the deed say nothing but good, but, between ourselves, I fancy Lieutenant Robinson will not be very keen on that monument.

Life is but a span, and Anno Domini is skilled in wrapping up the past and packing it away down in the cellar of memory. Short as life is, we fail to carry with us to the end an index of all those parcels packed away down below. Therefore, it is necessary that the more important ones should be marked with a cross in order that we may keep them in mind, but for goodness' sake do not let that cross be a potty little granite obelisk.

The felling of the night raider is but the business of the hour. Maybe before the war is ended many more of these monsters will dig their nose into English soil. We cannot erect monuments for all. That this one was the first is but by the way, and I shall not trouble to travel out to Cuffley to view ground that is exactly like all other ground round and about. The monument might some day be in somebody's way and be removed nearer to London. One spot is as good as another so far as I know.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to " Flight *" about it.*

H. F. (Woking).

The main reason for making the upper wing of a biplane of larger area than the lower one is that in any biplane there exists a certain amount of interference, which, although having little or no effect on the drag coefficients, reduces the lift coefficient of both wings taken together, the decrease in lift being more pronounced in the case of the lower wing than in the upper. Generally speaking the top plane carries about 30 per cent. more of the load than does the bottom wing. It will, therefore, be seen that by placing as great a proportion as possible of the total area in the upper wing the overall efficiency is increased. If this process is carried to its logical conclusion the result is, of course, the parasol monoplane; but from constructional considerations it is advisable to retain the biplane form, and aero-dynamically it is not advisable, from the point of view of fore and aft stability, to place the centre of resistance so far above the centre of thrust as it is in the parasol type. Since it is the lift coefficient rather than the drag coefficient that is affected by biplane spacing, it will be understood that the gain obtained with a larger top plane is more in the nature of increased climbing rate than in maximum speed.

A. C. (Peterborough).

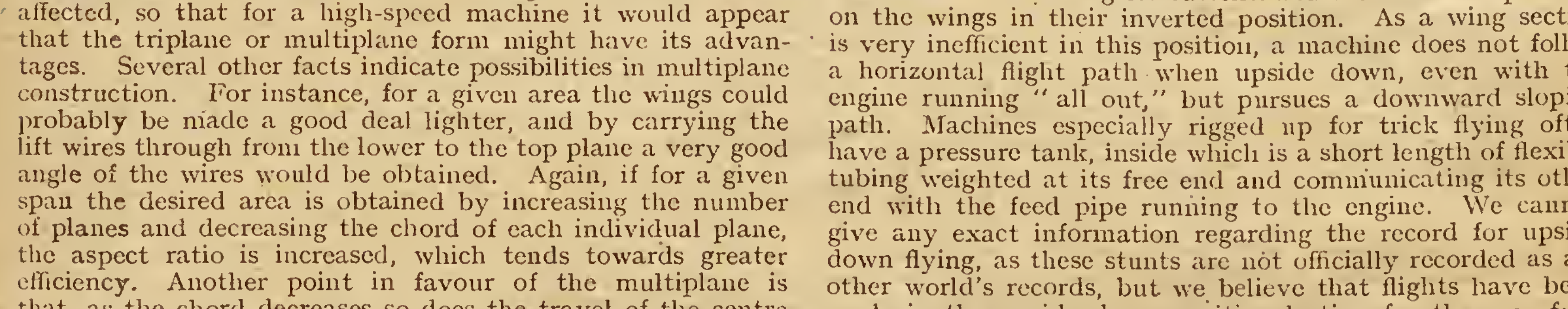
Multiplane construction is a subject on which in the past opinions have been divided, and has, as a matter of tact, its pros and cons. It has been explained above that interference between superimposed planes takes place, and the overall lift coefficient in a multiplane would therefore be somewhat reduced. On the other hand, the drag coefficient is little affected, so that for a high-speed machine it would appear that the triplane or multiplane form might have its advantages. Several other facts indicate possibilities in multiplane construction. For instance, for a given area the wings could probably be made a good deal lighter, and by carrying the lift wires through from the lower to the top plane a very good angle of the wires would be obtained. Again, if for a given span the desired area is obtained by increasing the number of planes and decreasing the chord of each individual plane, the aspect ratio is increased, which tends towards greater efficiency. Another point in favour of the multiplane is that, as the chord decreases so does the travel of the centre of pressure, so that the machine would approach more to fore and aft stability as regards the wings themselves. Owing to the small travel of the centre of pressure one inter-plane strut might be made to do the work of two, the length of strutting and wiring thus being halved. This has already been tried in biplanes, but is not very satisfactory, from a constructional point of view, when the chord is the usual, *i.e.* 5 to 6 ft.

A. M. (Basingstoke).

The engine you mention is, we believe, quite good, but would undoubtedly be improved by having mechanically operated inlet valves. There is no reason to suppose that it is particularly apt to cause a fire through backfiring, although it is, of course, a possibility.

A. H. B. (Bournemouth).

The accompanying diagrams will give an idea of some of the various distinction marks employed by the belligerents.



The British consist of circles, having a red centre and a blue circumference, with a white or (occasionally) the natural colour of the fabric in between. The positions for these circles are: Two on the upper surface of the top plane near the wing tips; two on the lower surface of the bottom plane, also close to the tips; one on each side of the body between the pilot's seat and the tail. Sometimes simply a red circle is used on naval machines. The rudder is painted with three vertical stripes in the following order counting from front to back: blue, white, red. The French distinction marks are similar to the British, with the exception that the centre of the circles is blue, and the circumference red. The Belgian, Serbian and Roumanian marks are similar to the French. The Russian marks are lateral stripes on the planes in the order from the leading to the trailing edge of the wing: white, blue, red. We believe, however, that lately the Russians have adopted circles similar to those of the other Allies. Our Italian Allies incorporate their national colours in a rosette on their machines. The device has a red centre, then a white ring with a green circle outside. In addition to the marks indicating nationality others are employed to distinguish machines engaged on special duties, but details of these marks cannot, of course, be given. The German and Austrian distinction mark is, as is well known, the black cross on white, while the Turkish consists of a white crescent and star on red. As a matter of fact, we believe that the Turks are now using the same black cross as the Germans.

H. C. B. (King's Lynn).

Lack of space prevents us from giving a technical explanation of looping the loop and upside down flying. The loop, of course, depends upon centrifugal force, and in a clean loop there is no reversal of pressure on the wings. If, however, the machine drops below a certain speed at the top of the loop, and comes out of it without completing the circle, it is quite conceivable that for a short space of time the air pressure is reversed. In upside down flying this is always so, the machine obtaining its sustentation from the air pressure on the wings in their inverted position. As a wing section is very inefficient in this position, a machine does not follow a horizontal flight path when upside down, even with the engine running "all out," but pursues a downward sloping path. Machines especially rigged up for trick flying often have a pressure tank, inside which is a short length of flexible tubing weighted at its free end and communicating its other end with the feed pipe running to the engine. We cannot give any exact information regarding the record for upside down flying, as these stunts are not officially recorded as are other world's records, but we believe that flights have been made in the upside down position lasting for three or four minutes. The diameter of a loop depends largely on the type of machine used. A fair average, we think, would be about 300 ft. Your last question is not quite clear, but we take it that you wish to know if it would be possible to reverse the loop—that is to say, loop with the undercarriage pointing towards the centre of the circle instead of away from it. As this would mean that the air pressure on the wings would be reversed, we are inclined to regard it as amongst the impossible.

J. S. (Stoke-on-Trent).—You should apply to the "special Recruiting Officer, Royal Flying Corps, Farnborough."

W. H. P. (Chicago).—There are two State flying schools in Australia—the Commonwealth School at Point Cook and the N.S.W. State School at Richmond, N.S.W.

L. B. (Birmingham).—Both the Anzani and Hispano-Suiza engines have stationary cylinders. The former engine is of the radial type.

C. H. (Manchester).

Theoretically, 1,000 cu. ft. of hydrogen will lift about 74 lbs. In practice this value is rarely reached, but for convenience it may be assumed that 35,000 cu. ft. will lift 1 ton.

AIRISMS FROM THE FOUR WINDS.

"P.B.'s" new paper *The Imperialist* should have considerable vogue.

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NOT A BIT OF IT.—(Zepp. relics are still wanted at the Horse Guards.)

Though that relic you'd add to your store,
Let your ownership cease ;
Give it up ! Why, in season of war,
Think of keeping the peace ?
(" The Office Window," *Daily Chronicle*.)

- - -

" HEIGHT 5 ft. 7 ins., very dark hair and grey eyes, of medium build, and a large hairy mole on his back." Such is the description—given by his parent at Old Street Police Court on Saturday—of Albert Henry Edwards, aged 16, of Bookham Road, who on August 23rd left home, and his mother is anxious to have news of him and his whereabouts, As his one ambition was to join up with the R.F.C., possibly someone in the Service has come across that large hairy mole, and will notify accordingly.

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A GOOD many readers of " FLIGHT " are also philatelists, or have sons or other relations who collect stamps. A chance to acquire a very charming addition to their present holding now offers itself, combined at the same time with helping an admirable war cause. Following the lead of the rest of the Allies, with the exception of Serbia and Roumania, Britain has now followed suit by issuing a special war-stamp through the agency of the National Philatelic War Funds Auction. This has been designed by British stamp collectors, and has been engraved and printed gratuitously by Messrs. Perkins, Bacon and Co., the printers of the first postage stamp ever issued, the historic " Penny Black " English stamp of 1840. These war stamps are being sold at *1d.* each, or *6d.* the set of six different colours, by the National Philatelic War Fund, 151, Strand, W.C. The proceeds go to the British Red Cross and St. John of Jerusalem.

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THE stamps are a work of art in themselves, the design being emblematic of Britain taking up the sword of justice. They have received the approval of King George through his Philatelic Secretary, who, in accepting the gift of a special die proof of the stamp for the King's collection, writes : " His Majesty is very pleased with the design, and thinks it most appropriate."

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BY means of similar philatelic issues by the Allies enormous sums have been collected in farthings and halfpennies in Russia, France, Italy and Belgium for the wounded or for the soldiers' widows and orphans. Moreover, many of these issues are already at a premium, so the acquisition of a set or two may presently prove to be quite a good investment. So hurry up, one and all, and add the nimble *6d.* to the fund which is so magnificently helping to allay the sufferings of our men who are crushing the war spirit out of the Hun.

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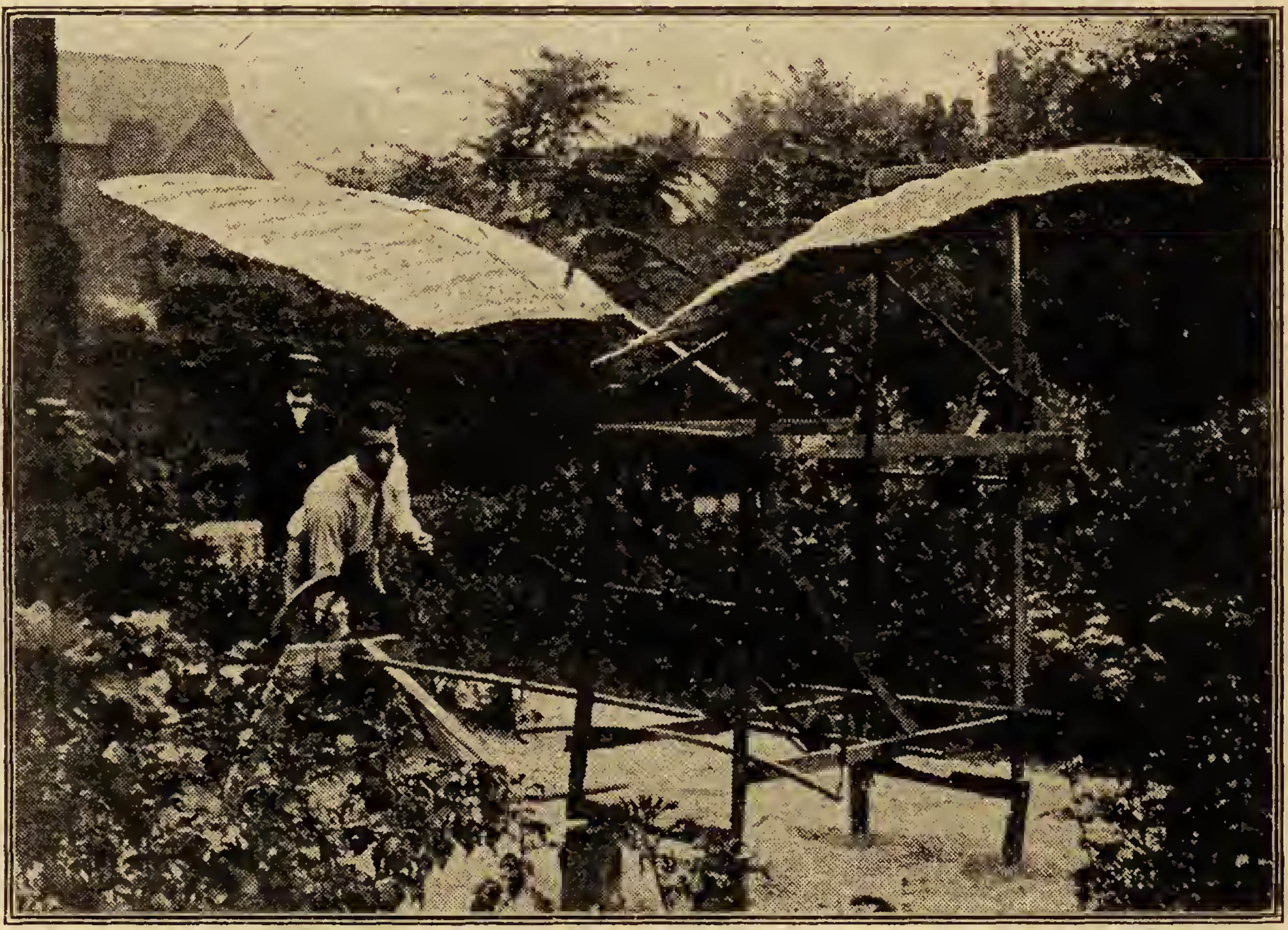
Autres temps, autres mœurs.—One time nothing was too good to say of the Roumanians by their would-be Allies, the Austro-Hungarian and Germanic nations. But now emerges for the first time the real opinions held of this Balkan people by their quondam friends. By way of a start the following from the *Pester Lloyd*, a well-known Budapest journal and a subsidised organ of the Hungarian Government, is not so bad. It is owned by the Pester Lloyd Society, a Jewish financial body of little repute so far as national morals are concerned. In a leading article this paper, discussing Roumania, writes :—

" Can this miserable and inferior State of perjurers and helots, of village tyrants and human beasts, which bears the branded name of Roumania, be more successful than its powerful Allies ? We can ask with Alexander Petösi whether we who have fought with lions are to be devoured by vermin ? The history, the justice, the necessity that lie in the facts, can reply that a blow of the fist delivered at the right moment by our tried arm, will suffice to sweep back the thieving crew into the filth of their native depravity.

" Practised and tested in the ways of a thief who steals from sleeping persons, the Roumanian Government has begun this war, the most evidently piratical of all wars, for the simple reason that they hoped to overrun a dead Hungary which had been exhausted by battle. We now inform Herr Bratiano that his infamous Press canaille has lied as impu-



Mons. Passat and his hand-operated flapping wing model to which reference was made in "FLIGHT" some weeks ago. Mons. Passat has for a number of years been experimenting quietly with wing-flapping machines, and has now succeeded in getting some quite promising results. In our photograph he is seen at the handle of his latest hand-operated model. Crude as it is, Mons. Passat demonstrated to us recently that he can lift with this model a weight of 80 lbs. This weight, it is true, is only lifted momentarily and not sustained for any prolonged period, but in view of the primitive arrangement even this is not bad for efficiency. Assuming that a man can develop for a short period one-fifth of a horse-power, this would give a lift, if driven by a petrol engine, of 400 lbs. per h.p., which is a somewhat startling figure. It would appear that the research authorities might not be ill-advised in granting Mons. Passat's method of imitating the flight of a bird a trial under more favourable conditions and with a mechanically improved model.

dently as he himself has lied. If Herr Bratiano thought to find a dead Hungary, he will soon be compelled to believe that he and his corrupt State have had their graves dug in Hungary. Roumania will find that she will be struck to the earth by an enemy who regards her as Hungary's most hated and most despised foe. Of Hungarian earth which now is in convulsion under the feet of the lowest liars and robbers in Europe not one yard will be left to the Roumanian perjurer."

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Gott strafe Rumanien truly !

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ALTHOUGH the Zeppelins got in first blow by bombing Bucharest, the strength of Roumania in the air will be no contemptible factor in the Balkan operations before long.

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VERY great stress is laid on the copyright of the admirable series of articles on the Navy by Alfred Noyes. We are wondering whether the copyright extends—and if it does, what the original inventor of it will have to say—to that delightful old chestnut which he has dished up in new garb as follows: " Followed a yarn of an English aviator, captured by the Germans, who was asked by his captors to take a German observer over one of our seas in his machine. At first he refused, but afterwards, strapping himself in position, consented. The German was armed, but bulky, and his straps were not to be depended on. Somewhere over the North Sea, in the dusk of that sunset, a trawler saw a remarkable sight. An English aviator was looping the loop, for sheer joy apparently, somersault after somersault, like a tumbler pigeon. He kept it up for half an hour. Then a dark bulk dropped from the machine and splashed into the North Sea. Perhaps it was a German, with a revolver in each hand. At any rate, an English aviator arrived on the East Coast an hour or two later, and he complained of feeling lonely."

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A ROME report states that a regular service of aeroplanes between Paris and Milan has now been established. Perhaps the wish is father to the statement, although we quite look forward to such *vitesse* methods of travelling when the wreckage of the present war has been sorted out a bit. We hope in the meantime the Germans have managed to get that Berlin–Constantinople air service into good working order for us. It should come handy presently.

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THERE are still several portions of the wrecked German airship which were taken away by civilians from Cuffley which the War Office would like to get back. Those who have relics should send them to the Horse Guards, and if they are of no value from a military point of view they will be returned.

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THE Lord Mayor, Sir Charles Cheers Wakefield, suggests that a Zeppelin award fund might be inaugurated to which everybody, and especially those within the metropolitan area, might contribute, and out of which a specific award might stand during the period of the war ready for every airman who should bring an enemy airship down. In the event of more than one person participating in the actual bringing down of a Zeppelin on British soil, the award might be divided on a *per capita* basis, as in the case of the £500 to the 353 men who destroyed the L. 15.

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ON Monday, September 11th, a lady pupil at a well-known Hendon school took her pilot's certificate in a masterly manner to the delight and admiration of numerous friends and onlookers. Shortly after, as the rumour goes, she gave vent to the following:—

THE LAY OF THE "LADYBIRD."

I am a little "ladybird,"
  I've learnt to fly to-day,
And why I've done this stunt of stunts
  I really cannot say.

But still I *am* a "ladybird,"
  And now I've got my ticket
I'll walk around old London Town
  And on my back I'll stick it.

And then to strafe the Hun I'll fly,
  And while I feed his hate,
I'll whisper, as I pass him by,
  "Say, is my ticket straight?"

– – –

THE enclosures at Hendon Aerodrome look quite smart with the new green-painted iron garden chairs scattered around in all their glory. They are certainly a great improvement on the old wooden "collapsable" ones.

THE U.S. Navy has ordered from France a Paul Schmitt hydro-biplane, trials with which are being carried out at Juvisy under the supervision of a U.S. Naval Attaché. It has two Tellier catamaran floats, and is equipped with a 150 h.p. Salmson engine.

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MR. ASQUITH was much interested in a R.F.C. centre during his few days at the Front last week.

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AMONG recent contributions to the Lord Mayor for the Lord Kitchener Memorial Fund is £100 from the Horlick's Malted Milk Co.

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THE Curtiss Aeroplane Co., of Buffalo, are, so far as we are aware, the first private aircraft firm to instal a modern wind tunnel for experimental research work. The new tunnel is similar to those of the National Physical Laboratory at Teddington.

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DR. A. F. ZAHM, of the Curtiss Co., is, we understand, in charge of the tunnel and entire aerodynamic laboratory.

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THERE can be no doubt that the establishment of a private laboratory of this kind is a step in the right direction, and the time does not appear very distant when every large firm of aircraft constructors will probably have their own tunnel. Much valuable time will be saved in this manner through doing away with the necessity of sending scale models of wing sections or of complete machines away to a laboratory already pretty full up with Government work.

By way of a souvenir of the very happy opening by Sir Charles Wakefield, the Lord Mayor of London, of the Whitehead Aircraft Co.'s new premises, Mr. J. A. Whitehead has got together an extremely interesting little booklet, of which the above clever drawing (reduced) by F. H. Townsend, forms the front cover. The idea of Lord Mayor Wakefield receiving the output of the factory one by one and launching the machines into the air is a happy inspiration. The rest of the pages are made up of photographs of the new premises, the ceremony at the opening, and facsimiles of press notices, &c., with an excellent photographic frontispiece of the Lord Mayor of London, Sheriff Shead, and Mr. J. A. Whitehead.

After the war, when competition will call for still more scientific methods, the manufacturer who has at his disposal a wind tunnel for the experimental determination of the thousand and one problems that crop up in the design of an aeroplane, will be at a decided advantage over a competitor not so equipped.

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Congratulations, therefore, to the Curtiss firm, for their foresight in being the first to erect a tunnel.

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Tuition is now in full swing at the various civilian flying schools which have made arrangements with the W.O. for training of military pilots. It appears that not only are these pupils receiving tuition in practical flying, but that they have opportunities of attending lectures on the theory of the aeroplane.

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On Friday of last week a lecture was given by Mr. A. A. Fletcher, the designer of the successful L. and P. biplane, whose subject was "The Flow of Air around Wing Sections." After the lecture the pupils had an opportunity of asking questions regarding any points that they did not quite understand, and many availed themselves of this, so that altogether a couple of most interesting and highly instructive hours were spent talking "shop."

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The practice of thus letting a certain amount of theory go hand-in-hand with practical instruction is highly commendable, and one from which the flying services in general cannot but benefit.

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Mr. Smiles had a narrow escape the other day when his engine "gave up the ghost" just as his machine had reached the stage of a loop where she was slightly past the vertical. The altitude at the time was not exactly a "safe" one, but the machine instantly got her nose down, and her fore and aft stability is such that she passed out of the ensuing nose dive just in time. The damage was confined to a couple of burst tyres and a buckled chassis strut.

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The moral is obvious. If you must loop, do it at a reasonably safe altitude.

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After various unavoidable delays the new flying school at Cheltenham has now so far progressed that it is expected to make a start about the middle of this month. Three machines—two 50 h.p. and one 60 h.p. Ruffy-Baumann biplanes—are already there, and more are ready to go as soon as required. The aerodrome is well situated, and has an area of about 150 acres, so that the new school should have good prospects of growing to considerable importance.

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Mr. Fanshawe, formerly of Harrods Stores, who has taken his "ticket" at the Ruffy-Baumann School, will be one of the instructors, and is also, we understand, interested in the company.

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Since the Gyro motor was first introduced in this country little has been heard of it. It now looks as if visitors to Hendon may have an opportunity of again listening to its healthy bark, as we understand that a new one of 110 h.p. is expected to arrive shortly, when it will be fitted to a Grahame-White scout.

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Smiles appears to be as good at diving in water as he is in the air.

Pity his efforts at rescuing 10-year old Sydney Howlett were not completely successful. He had to dive into the Silk Stream, Hendon, six times before he found the body, but the boy was then past help.

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His gallant conduct is very rightly being brought to the notice of the Royal Humane Society.

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal) of September 8th,* 1906. "Flight" *was founded in* 1908.

Lebaudy Developments.

Thanks to the enterprise of our contemporary, *Les Sports*, we are able to give below some particulars of the present position of the great Lebaudy airship that is destined ultimately to be stationed for service at the fortress at Verdun. . . . The large aeroplane, a prominent feature of previous constructions, is, as our readers are aware, to be retained, but it has been constructed so that it can be taken to pieces to enable the airship to be readily packed up and transported by train. The machine is to be propelled by a Panhard motor running at a speed of 950 r.p.m. and developing 70 h.p., and weighing 350 kilos. . . . The vessel at present building is destined, as we have already said, to take up its station at Verdun, but before proceeding thither it is intended to employ it in naval manœuvres at Toulon with a view of securing data regarding the effectiveness of the airship in naval engagements, which, it is anticipated, will prove to be very great, if for no other reason than the readiness with which submarines can be detected from a height above the surface of the water. . . . M. Julliot calculates that these airships of the future will be carrying at least 500 kilos. of shell, weighing from 5 to 50 kilos. each. As regards the possibility of being injured by hostile fire, M. Julliot says that the future airships will be designed to manœuvre at 800 to 1,000 metres above the ground, and at this height, he points out, they are in no danger from either rifle or shell fire.

Royal Patronage for the Aero Club.

It is announced that the King of Spain, who takes the keenest possible interest in aeronautics, has consented to become an honorary member of the Aero Club of the United Kingdom. His Majesty is the President of the Royal Aero Club of Spain.

For the Krabbe Prize. A Lady's Balloon Record.

On Saturday and Sunday last, the Hon. Mrs. Harbord and Mr. Frank Butler made what is so far a record run for the Cup offered by Miss Krabbe, of the Aero Club, for the longest aerial journey in Great Britain. The balloon started at ten minutes past eight on Saturday evening, travelling all through the night with a southerly wind and a bright harvest moon. . . . Knowledge of their whereabouts was rather impeded by the presence of a heat fog in the early morning, but at 5.20 they found they were at Brigg; at 6 they crossed the Humber; and finally they descended at Bridlington at 8 o'clock, having in all covered 200 miles in slightly under the 12 hours.

Another U.S.A. Navigable Balloon.

Airship construction on the Santos Dumont lines continues to flourish in the United States, and Major C. J. S. Miller, who has had a big affair of this kind constructed for him, has recently made a successful excursion. The airship is capable of taking up two passengers and Major Miller was accompanied by his wife.

Complimentary to Ireland.

Herr Karl von Wiegand, in a message to the *New York World*, quotes a Zeppelin commander as saying :—

"I believe that, with the latest Zeppelins being turned out now and which are beginning to be used against England, I could cross to America, providing the meteorological conditions were favourable."

The commander further said that the new Zeppelin can reach every corner of England, Scotland and Ireland; but, adds Herr von Wiegand—

"I learn that Ireland is outside the zone prescribed for Zeppelin attacks; that so far as Zeppelins are concerned Ireland is not regarded as enemy territory."

Three Months for False Alarm.

Three months' imprisonment was the well-merited punishment meted out at Lincoln the other day to Harold Storey, a stoker, for having in a drunken condition entered the Corporation Electricity Works on the night of September 1st, climbed to the roof and blown the Zeppelin buzzer twice. When remonstrated with, he said, "I have won my bet." We fancy he has found the stakes a bit heavier than he bargained for.

Toronto Assists Flying Men.

It is announced from Toronto that the City Council is making grants of 32s. per week each to students from that city preparing for the Royal Flying Corps.

Personals

Casualties.

Second Lieutenant Geoffrey May Allen, of the R.F.C., who was killed on September 2nd, was the only son of Mr Gilbert Allen, of Hawkfield, Basingstoke. Born at Rivemar, California, in 1894, he was educated at Blundell's, Tiverton. He enlisted in the Surrey Yeomanry in September, 1914, and served with them as Despatch Rider first in Egypt and afterwards in France. He obtained his commission in the R.F.C. a few months ago.

Second Lieutenant Charles Herbert Hills, Manchester Regiment, whose death is announced, was the younger son of Colonel E. H. Hills, C.M.G., F.R.S., and of Mrs. Hills, of 1, Campden Hill, W., and a nephew of Major J. W. Hills, M.P. He was born on January 23rd, 1895, and educated at Horris Hill and Eton. After some months spent at the Agricultural College at Wye, he went out in July, 1914, to the Orange River Colony to farm. He fought as a trooper in Botha's Light Horse all through the rebellion. In September, 1915, he returned to England and joined the R.F.C. In April he joined his regiment, the 3rd Manchester Regiment, and at the end of July went out to the Front, where he was attached to another battalion of the Manchester Regiment.

Lieutenant Eric Craven Jowett, R.F.C., who died on July 9th, in a German hospital, of wounds received the previous day, aged 24, was the younger son of Mr. and Mrs. Edmund Jowett, of Melbourne, Australia. He was studying at Cambridge when the war broke out, and joined the Northumberland Fusiliers, where he got his commission. Early in 1915 he joined the R.F.C., in which he was serving when he was wounded. He got his "wings" early in 1915, and became Lieutenant in April, 1916.

Married and to be Married.

An engagement is announced between Captain C. Drury Fuller, R.F.C., elder son of Mr. and Mrs. Herbert H. Fuller, of 31, Palace Court, and Beatrice, only daughter of Sir Robert and Lady Fulton, of 7, Sloane Gardens.

The engagement is announced between Flight-Sub-Lieutenant Graham McHardy, R.N.A.S., son of Captain Hardy McHardy, R.N., late Chief Constable of Ayrshire, and Frances Valencia, only daughter of the late Colonel Harry Shuldham-Legh, M.V.O., the Royal Irish Regiment, and Mrs. Shuldham-Legh, of Heather Brae, East Liss, Hants, and great-granddaughter of the late Rev. David Rodney Murray, of Brampton Brian.

The engagement is announced between Lieutenant Philip Clay Penberthy, K.S.L.I., attd. R.F.C., eldest son of Mrs. S. E. Penberthy, Canfield House, Hampstead, and Ena Beatrice, younger daughter of the late G. Johnston-Smith and Mrs. Johnston-Smith, of West Heath Mount, Hampstead.

Items.

The will of the late Major Victor Onnesley Barrington-Kennett, R.F.C., of Cheyne Gardens, Chelsea, killed in a fight with a German aeroplane in France on March 13th, has been proved at £314.

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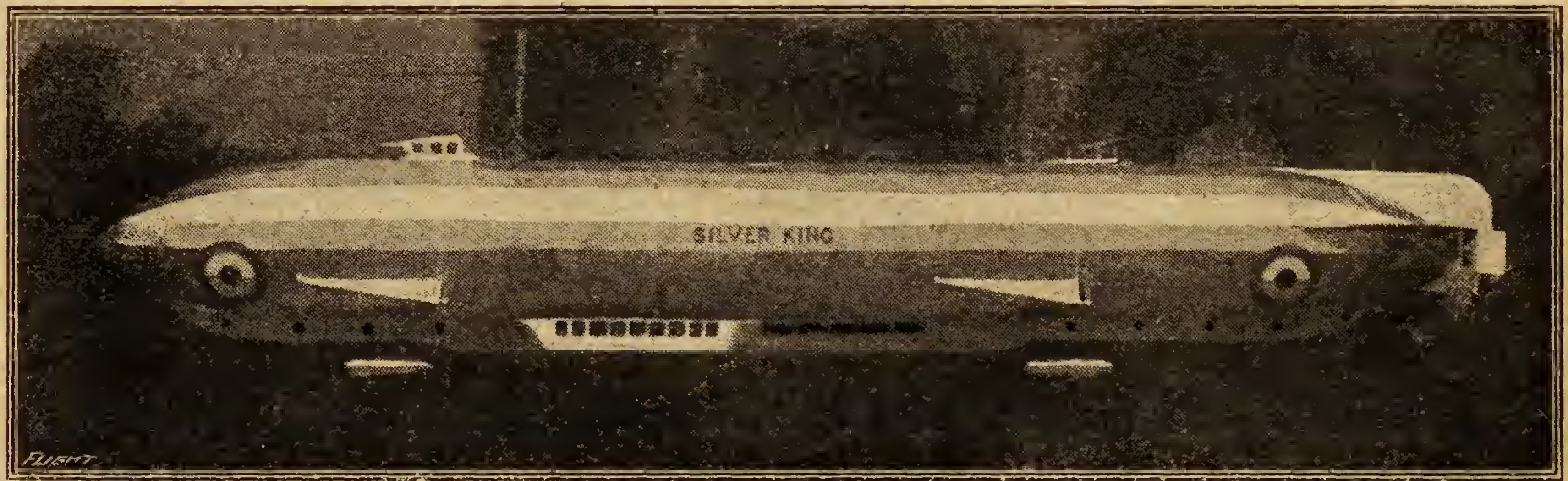
AN ALL-BRITISH ZEPPELIN.

To demonstrate the application of the various dopes, varnishes and paints for dirigibles, Messrs. Thos. Parsons, of Oxford Street, London, W., have on view at their showrooms the excellent model of a rigid airship shown in the accompanying illustration. The framework is of wood and metal, and the covering is of fabric. The latter is doped and varnished, and is then given a final finish of aluminium paint, which, owing to its very high polish brought about by its special application, reduces skin friction to a minimum.



A realistic model of a rigid airship constructed by Messrs. Thos. Parsons and now on exhibition in their Oxford Street window, to demonstrate the application of their dopes, varnishes, and paints for airships.

Mr. A. W. Coker, who, we understand, is responsible for the construction of this model, is to be congratulated upon the accuracy of detail displayed in the "Silver King." It is to be hoped that Parsons' will be supplying *large* quantities of the dopes, varnishes, paints, &c., for use on *real* British rigids.

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Bucharest and Air Raids.

Some interesting details as to the precautions taken in Bucharest against air raids is contained in the following message from the *Times* correspondent, who also mentions that the Germans are using a Parseval airship down there. Writing on September 10th, he says: "The authorities have taken all measures to prevent enemy air raids. Visits from airships were expected from the first day of mobilisation, and accordingly very strict orders were issued on that day and obeyed willingly by the population. The city is kept in darkness, the few street lamps which are kept alight being painted a dark colour, and strong searchlights sweep the sky. The people are ordered by the regulations to go into their cellars, but they always remain in their yards and in the streets to watch with curiosity and contempt the vain efforts of the enemy. The first raid was a complete failure. The enemy was driven away by artillery fire without causing any damage. The second raid was made by a Parseval and several aeroplanes, and the enemy succeeded in dropping bombs at several points of the town, but their object of hitting important buildings was not attained, as the bombs fell mostly in the gardens of two small private houses without causing any loss of life. After a violent cannonade the airship had to withdraw, having completely failed in her task."

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), September 5th, 1.20 p.m.

"During September 3rd hostile aircraft showed great activity, and the fighting in the air was continuous. The enemy's aircraft were forced to remain some miles in rear of their own line, and entirely failed to interrupt the work of our machines. On two separate occasions our aeroplanes opened fire on the enemy's troops on the ground. As a result of many combats three hostile machines were brought down and seemed to be wrecked, and many others were driven down in a damaged condition. One of our aeroplanes destroyed a hostile kite balloon. Two of our machines are missing."

General Headquarters, September 5th, 10.35 p.m.

"Yesterday, in spite of the very unfavourable weather conditions, our aeroplanes carried out successful co-operation with our artillery."

General Headquarters, September 6th, 10.55 p.m.

"Yesterday our aeroplanes continued their usual successful co-operation. One of our patrols, consisting of four machines, encountered and drove off a hostile patrol of 13 aeroplanes. One of our machines is missing."

War Office, September 6th.

"*Egypt.*—On the morning of September 4th the Royal Flying Corps carried out a further raid on the enemy's encampment at Mazar. One anti-aircraft gun was put out of action, and a number of bombs were dropped with good effect on camps, supply depôts and camel lines."

War Office, September 7th.

"*Salonica.*—We shot down an enemy aeroplane, which fell in flames in Doiran.

Egypt.—"On September 5th two of our aeroplanes raided the Turkish aerodrome and aeroplane repair section at El Arish. Twelve bombs were dropped, with apparently good results.

"Enemy aeroplanes attacked our machines, but did not close, and only opened fire at long range. They ultimately gave up the fight, and our machines returned undamaged."

General Headquarters, September 7th, 10.19 p.m.

"Our artillery replied effectively, and, assisted by aerial operations, successfully dealt with the enemy's batteries.

"Yesterday our machines bombed an important railway junction on the enemy's lines of communication, causing great damage to the station and rolling-stock. One of the enemy's aerodromes was bombed, one machine being destroyed on the ground, and others damaged. Many other points of military importance were bombed. Some good work was done from low altitudes, locating the positions reached by our troops. Three hostile machines were wrecked, and four others were driven down in a damaged condition. Two of our machines are missing."

General Headquarters, September 8th, 10.8 p.m.

"Yesterday artillery fire was directed by one of our aeroplanes on a hostile machine, which landed behind its own lines. The machine was set on fire and destroyed.

"Ten of the enemy's aerodromes were bombed with good effect, and there were many aerial combats. One of the enemy's machines was forced down."

General Headquarters, September 9th, 11.45 p.m.

"Yesterday afternoon many air fights took place. Our aircraft bombed another of the enemy's aerodromes, two hangars and a shed being destroyed. One of our machines is missing."

War Office, September 9th.

"*Egpyt.*—On September 8th three of our aeroplanes again raided El Mazar. Of the 20 bombs dropped, 11 were seen to take effect in enemy camps."

General Headquarters, September 10th, 11.10 p.m.

"Yesterday the progress of our attacks was closely followed by our airmen, who at times engaged hostile troops with machine-gun fire.

"In the course of many aerial combats three hostile machines were destroyed and some others driven down damaged."

French. *Paris, September 5th. Afternoon.*

"One of our aeroplanes which was attacked by four enemy machines succeeded in freeing itself from its opponents, one of which, subjected to machine-gun fire at very close quarters, crashed to the ground in the Chaulnes district."

Paris, September 7th. Afternoon.

"Our air service took an active part in the actions of the past days on the Somme front, watching the movements of the enemy's infantry, carrying out bombardments in the rear of the German lines, and attacking with machine guns troops on the march. Our machines, armed with guns, repeatedly bombarded the enemy's trenches. During the air fights which took place yesterday two machines were brought down by out pilots. One fell in the direction of Gueudecourt, and the other in the neighbourhood of Brie-en-Santerre.

"Five other German machines were forced to descend damaged."

Paris, September 7th. Evening.

"During the night of the 6th, in spite of unfavourable atmospheric conditions, 16 of our bombarding aeroplanes dropped heavy bombs on railway stations, bivouacs and enemy stores at Roisel and Villecourt (Sommecourt), where a big fire was caused."

Paris, September 8th. Evening.

"Yesterday on the Somme front two enemy aeroplanes were brought down in the region of Epenancourt. Another was forced to land after a fight near our lines and was destroyed by artillery fire. Three other enemy machines appear to have been badly hit. The observer in one of them was killed by a machine-gun bullet.

"It is confirmed that on the 5th inst. Lieut. Guynemer brought down his fifteenth enemy aeroplane in the region of Ablaincourt."

"*Salonica.*—An enemy aeroplane was brought down south-west of Lake Doiran. The machine fell in flames in our lines."

Paris, September 9th. Afternoon.

"In spite of the high wind blowing last night, one of our air squadrons dropped 24 bombs on the railway stations at Etain and Conflaus, and on the works at Rombach."

Paris, September 10th. Afternoon.

"Yesterday about 11.30 p.m. a German aeroplane dropped four bombs on Belfort. There was no loss of life, and the material damage was unimportant.

"Flight Warrant Officer Baron and Flight Warrant Officer Emmanuelli again bombarded the powder factory at Rottweil on the night of September 9th–10th. They left at 8.50 p.m. and dropped at 10.55 six bombs of 155 mm., which were seen to fall in the region east of the powder factory buildings. Explosions were distinctly heard, and were followed by volumes of white smoke rising from the armament establishments. Without hindrance the aviators returned safe and sound at 12.50 a.m."

Paris, September 10th. Evening.

"On Saturday our aeroplanes were engaged in 40 actions over the enemy lines, in the course of which the German aircraft suffered appreciable losses. On the Somme front Warrant Officer Dorme brought down his ninth aeroplane, which fell at Beaulencourt, south of Bapaume. Four other German machines fell damaged, one in the region of La Maisonnette, the others to the north and east of Peronne. On the Verdun front an enemy aeroplane, which came under machine-gun fire at very short range, crashed to the ground near Dieppe. Another machine was brought down in the German first lines near Vauquois, Argonne.

"During Saturday night one of our squadrons dropped 480 bombs on the stations and enemy depôts in the region of Chaumy. Several machines belonging to this squadron twice flew from their aerodrome to the place where the bombardment was carried out. During the same night 18 of our aeroplanes dropped numerous bombs on the military establishments at Ham and in the region to the south of Peronne. Numerous fires were observed in the bombarded districts."

Paris, September 11th. Afternoon.

"Last night 10 of our aeroplanes dropped 60 bombs of heavy calibre on important military factories south of Bruges. The bombardment, which was carried out from a height of between 400 and 800 metres (1,300 to 2,600 ft.), was very effective. On the same night 104 bombs were dropped on cantonments and ammunition depôts north of Somme-py. Violent explosions were heard. Finally, one of our air squadrons bombarded the barracks and aerodrome of Sarrebourg. Twenty well-aimed bombs of heavy calibre inflicted serious damage."

Russian. *Petrograd, September 9th.*

"Our torpedo-boats bombarded the port of Baltjik on the Bulgarian coast and sunk 21 barges, in which the Bulgarians were shipping bread from this port. Enemy seaplanes attacked our torpedo-boats without result."

Petrograd, September 10th.

"Seven aeroplanes flew over the country through which the Kowel–Rojistche railway runs. Our airman, Capt. Kazakoff, engaged two of the enemy machines in successive fights and forced them to beat a retreat to the west. One of them fled with a long trail of smoke streaming out behind it.

"In the Baltic Sea, in the morning of September 9th, enemy hydroplanes carried out an unsuccessful raid on the island of Runo, in the Gulf of Riga. At Riga in the course of the day enemy hydroplanes made their appearance several times over the Irben Strait and engaged in air fights with our aeroplanes. In spite of the enemy's numerical superiority his machines were driven off every time.

"Naval Ensign Safanoff brought down an enemy machine, which fell in the sea."

Italian. *Rome, September 5th.*

"On the Middle Isonzo and on the Carso there was only intermittent artillery activity. Our batteries destroyed an enemy kite balloon near Sella (Selo).

"During the evening of the 3rd, hostile aircraft dropped bombs on Marano, and yesterday on Lucinico, Sdraussina and Gorizia. Three dead and some wounded are reported in the town of Gorizia; the roof of the church of St. John was seriously damaged. A seaplane squadron during the night of the 4th dropped 20 bombs on Venice without doing any damage."

Rome, September 6th.

"*Albania.*—An Italian aircraft squadron bombed Fieri, headquarters of the enemy command. One of our Farman machines failed to return."

Rome, September 9th.

"Last night, in spite of bad weather, one of our airships reached the Duino–Trieste Railway and dropped 600 kilogrammes of explosives on the line."

Rome, September 11th.

"An Austrian aeroplane dropped bombs on Sondrio, without doing any damage."

Belgian. *Havre, September 11th.*

"On the evening of September 6th a Belgian aviator executed a three hours' flight, covering 300 kilometers (187 miles), in darkness, and flying over Brussels, where he dropped proclamations.

"On September 7th another Belgian airman in favourable weather proceeded over Antwerp with the same object. In these two towns the excitement must have been very great. The aviator perceived crowds of people in the public square."

Roumanian. *Bucharest, September 5th.*

"Aeroplanes and airships dropped bombs on Bucharest, damaging four houses and injuring two men and one woman.

"Bombs were also dropped on Piatra, in the district of Neamtzu (Northern Rumania), where an old woman was wounded; Ploeshti (between Bucharest and Sinaia); and Constantza, where slight damage was done."

Bucharest, September 8th.

"An attack on Constantza was made by enemy aeroplanes, which dropped bombs, injuring two women and one child."

Bucharest, September 9th.

"Our aeroplanes bombed successfully an enemy camp at Tutrakan."

German. *Berlin, September 4th.*

"On September 2nd and 3rd, in air fights, we shot down in the Somme sector 13, and in Champagne and on the Meuse two, enemy airmen respectively. Capt. Boelke, who placed *hors de combat* his twentieth enemy aeroplane, and Lieuts. Leffers, Eahlbusch and Rosencrantz, greatly distinguished themselves in the recent successes. By anti-aircraft fire in the Somme and Meuse sectors four enemy aeroplanes have been brought down since September 1st.

"On September 2nd French aerial attacks caused insignificant damage in the fortress region of Metz. Five persons were wounded, and some material damage was caused by several bombs dropped on the town of Schwenningen."

Berlin, September 5th.

"*Balkans.*—German seaplanes bombed Constantza and Russian light sea forces.

"Our airships successfully dropped bombs on Bucharest and the petroleum wells at Ploeshti (midway between Bucharest and Sinaia)."

Berlin, September 6th.

"In air fighting and by anti-aircraft fire three enemy aeroplanes were felled."

"*Balkans.*—On September 4th seaplanes, acting in cooperation with Bulgarian military and naval forces, successfully dropped bombs on Roumanian batteries and entrenched infantry positions in the Dobrudja, and also on the railway station and oil tanks at Constantza."

Berlin, September 8th.

"On September 6th our naval aeroplanes bombed hostile naval forces off Arensburg, Isle of Oesel. A hostile airman was brought down near Zevel.

"On the night of September 6th one of our naval aeroplanes successfully dropped a large number of bombs on the Russian aerodrome on the Island of Runoe, in the Bay of Riga.

"On September 7th a Russian gunboat bombarded the north coast of Courland without success. She was pursued and bombed by our naval aeroplanes."

Berlin, September 9th.

"At noon on Thursday German seaplanes successfully dropped bombs on the grain silos, oil tanks and the railway station at Constanza, and also on the Russian naval forces in the port. Despite strong hostile gunfire, all our seaplanes returned undamaged."

Berlin, September 10th.

"On the Somme front recently our enemies lost nine aeroplanes in aerial fights and three more by anti-aircraft fire. Capt. Boelcke shot down his twenty-second enemy airman."

Austrian. *Vienna, September 5th.*

"During the battle Field Pilot Arigi shot down an enemy battle aeroplane. One of its occupants was killed and the other has been taken prisoner."

Vienna, September 6th.

"On the evening of the 4th inst. one of our naval aeroplane squadrons dropped bombs with good effect on military establishments at Venice and Grado (in the lagaoon district west of the mouth of the Isonzo). One aeroplane has not returned."

Bulgarian. *Sofia, September 5th.*

"An enemy fleet bombarded the fortifications north of Kavalla, and enemy aeroplanes dropped bombs on the villages of Starovo and Hazuatar, as well as on the Angista Station."

Sofia, September 10th.

"On September 5th two enemy destroyers bombarded Baltjik and Kavarna without causing great damage. They were driven off by bombs from German seaplanes, which also successfully bombed Russian naval units at Constanza, as well as storehouses, petroleum tanks and the railway station. Over 200 bombs were dropped on the harbour, the depôts and the barracks at Mangalia."

R.N.A.S. Raids.

THE following announcements have been issued by the Admiralty:—

September 8th.

"An attack was carried out yesterday afternoon by naval aeroplanes on the enemy aerodrome at St. Denis Westrem. A large number of bombs were dropped with good effect. One of our machines failed to return.

"During the course of the same afternoon a naval aeroplane successfully attacked and brought down in flames a hostile kite balloon near Ostend. The attack was carried out under anti-aircraft fire of the heaviest description, but the pilot returned safely."

September 9th.

"An attack was carried out this morning by naval aeroplanes on the enemy's aerodromes at Ghistelle and Handzaeme. A large number of bombs were dropepd with satisfactory results. All the machines returned safely."

September 10th.

"An attack was carried out by naval aeroplanes during the afternoon of the 9th inst. on the railway siding and ammunition dump at Lichtervelde. Machines returned safely."

From Other Sources.

The *Morning Post* correspondent, writing from Petrograd on August 21st of the fighting in the marshy ground traversed by the tributaries of the Stokhod, says :—

" Under such circumstances aeroplane activity is plainly suggested, and the Germans have concentrated this arm of their forces in remarkable strength at Kowel. Twice daily, morning and evening, flotillas, working together like fleets at sea, swoop down upon this difficult region, and, enjoying comparative immunity from artillery fire, and therefore flying lower than is customary nowadays at the Front, they do considerable execution. This execution, to no small extent, is due to a new form of aeroplane bomb, which is exceptionally efficient. It is an Austrian production, and it is, I believe, the first contribution of Austrian inventiveness to the machinery of this war. Its main feature is a heavy rubber base, in which a detonator is embedded. But, principally, its effectiveness is due to the fact that the explosion radiates from the centre laterally and not upwards. Anywhere above a man's average stature there is comparative safety, even in close proximity to a bomb. In the space below that height, for a distance of 20 or 30 yards around, death or mutilation is almost certain. The effect of a rain of these new bombs from an aeroplane flotilla upon an area where dug-outs are impossible defies the imagination. During the first days of their use, when the enemy had the advantage of that deadly element in war—surprise—he gained some temporary successes owing to the rain of destructive bombs which he was able to drop upon certain important centres. Now, however, that the element of surprise has evaporated, the Germans' success is markedly decreasing, as is the way with practically all enemy inventions in this war. . . .

" On my way back from the Russian front I visited Minsk, arriving there only a few hours after a bombardment by German aeroplanes. The results were quite ridiculous from the point of view of serious warfare. I examined the places where the bombs exploded. About a score of people had been killed or injured, but only two of them were wearing uniform, and that not the military but the police uniform. A number of women on their way to market in the early morning were among the victims. One poor old market woman, sitting beside her basket of wares, lost both of her lower limbs. A girl, aged 16, was killed. The material effect was merely to provide work for plasterers and glaziers. This is not war, but it amuses the Germans. One must congratulate them on succeeding in dropping every bomb into an open street. Not a single building suffered damage beyond defacement of plastered fronts and wholesale smashing of glass.

" This particular bombardment was the German form of reprisal for Russian aviators' activity at Baranowitchi a few days before. Baranowitchi is a strategic point of prime significance for a certain part of the front, and is therefore a legitimate objective for all forms of warlike operations. It is the pivot of the German front, contains the immense stores of the German forward base, and is a thoroughly fortified centre. Minsk is none of these things, so that it would appear that the Germans, having been attacked by Russian aeroplanes in a purely war centre, look around for the nearest convenient township and make an air raid on it in retaliation and in order to provide news for the German press. At any rate, no other war purpose can be served by such raids upon peaceful townships. The Russians the same night heavily avenged this reckless killing and wounding of women and civilians. Several of their big 'Dreadnought' aeroplanes again visited Baranowitchi and dropped a quarter of a ton of bombs on military stores at the station and in the artillery magazines. Thirteen took effect, and terrific explosions and large columns of flame indicated the extent of the damage done."

Mr. Edmund Candler, writing to the *Times* from Mesopotamia on August 25th, states :—

" On the Tigris front military operations during the last month, excepting the usual sniping and continual harassing of the enemy with artillery fire, have been confined mainly to air raids and encounters with hostile aircraft. On August 12th our machines brought down an enemy Fokker in an encounter on the river bank opposite Magasis Fort, near Kut. Our guns opened on a stranded machine and destroyed it.

" At night on August 14th our aeroplanes, flying very low, dropped bombs on the enemy's sheds and the bridge at Shumran. Owing to the dust and uncertain light it was impossible to estimate the exact damage, but it is significant that for many days after the event our reconnaissances were unmolested."

The Times special correspondent at the British Headquarters in France, in a despatch dated August 31st, writes :—

" After the rain the air has been clear, and aeroplanes have been very active this afternoon. At the part of the front where I was we had over 30 kite balloons up, and the air above was full of aeroplanes and of the black puffs of shrapnel smoke from German guns. At one time I counted 15 of our machines so close together that the field of my glasses would take them nearly all in at once, circling and weaving in and out like a flight of rooks. Around and among them all the time the shrapnel burst, and it seemed amazing that none was hit. What their particular business was I do not know ; but the superb indifference with which they came and went, passed and repassed, while the air about them was dotted with black smoke-balls till it looked like a pin-cushion studded thick with black-headed pins, was magnificent to watch."

Mr. W. Beach Thomas in a despatch to the *Daily Mail* on the same day notes :—

" Each day I see more of his (the enemy's) kite balloons and rather more of his aircraft, but the sense of inferiority lies heavy on his infantry. They write home sarcastic comments on their own aircraft and grim accounts of our guns."

A Reuter message from Athens on September 1st regarding the arrival of the Allies' warships notes that there are some seaplanes with the Fleet.

In a despatch from the Press Camp, France, on September 2nd Reuter's Special Correspondent says :—

" A steady increase in the heavy artillery of the enemy has been noticeable during the past week, and, notwithstanding the bad weather, German airmen have been much more lively, although they only venture over our lines in strong squadrons, and only then very occasionally. Their attempt to re-establish observation is proving pretty expensive to them. The total " bag " accounted for yesterday over the Anglo-French lines amounted to 19 machines."

An Exchange message from Cairo on September 4th states :—

" Yesterday morning an Australian flying squadron carried out a successful reconnaissance in Sinai. One airman performed a most gallant feat. He flew back some eighty miles in order to pick up a comrade who had been compelled to descend owing to engine trouble, and succeeded in bringing him back in safety despite the fire of the enemy."

According to a Reuter message describing the capture of Mrogoro in East Africa, the booty taken included a 4·2 naval gun ingeniously mounted on a locomotive turntable to serve as an anti-aircraft weapon. It is also noted that our aeroplanes have left their mark on the railway buildings.

Mr. G. J. Stevens, writing to the *Daily Telegraph* from Athens on September 3rd, says that he had received the following information dated September 1st from his correspondent with the Serbians at Sorovitch :—

" The German field telephone and aviation services, which arrived here two days ago, left again to-day. They went back in the direction of Florina, carrying with them all their apparatus and paraphernalia."

Mr. W. Beech Thomas, in a despatch to the *Daily Mail* on September 3rd, regarding the new " push " from the Delville Wood, says :—

" The perspective of this new fighting is beyond the reach of the senses, even for an onlooker. For myself, as I was dunned, almost in my ear, by the bark of some heavy howitzers . . . I looked up and found the air populous with our aeroplanes. Fourteen of them in a flock were heading for the enemy's lines. They too were part of the battle ; and before many minutes were doubtless telling our gunners across the towering distances at just what corner of what map-square such and such German guns were located."

The *Echo Belge* reports that " On the morning of August 25th a squadron of Allied aeroplanes bombarded the neighbourhood of Ghent. At 8.20 a.m. the first bombs were dropped, and the bombardment continued until 8.55. Suddenly a big explosion was heard. It lasted 15 secs., and shook all the windows in the town. Doubtless one of the ammunition depôts was blown up. Five minutes later a second explosion occurred of similar violence. It is rumoured that the damage done and the number of victims are very great.

"The journal further learns that in the course of this attack a gunpowder depôt at Meirelbeke was blown up, and a Zeppelin which was stationed at St. Denis Westrem was seriously damaged."

The *Telgraaf* on September 3rd reported from the frontier that Allied airmen executed a raid over Belgium. At 7 o'clock on the previous evening three aeroplanes were seen above Zeebrugge. They were heavily fired at, but none of them was hit. Some aeroplanes were also observed flying over the sea.

Reports from Rome state that one of the Italian naval airships, during the night of September 3rd, effectively bombed the military works at Lussin-Piccolo, Istria. Care was taken to avoid hitting inhabited places. The airship returned unharmed to her base.

The correspondent of the *Berliner Tageblatt*, writing from the Somme area, says:—

"The French keep the occupying troops down with shells until the moment of advance, and employ at the moment of attack by assault airmen with machine guns at the rear of the enemy."

The *Times* correspondent at Bucharest, on September 4th, telegraphs:—

"Last night Bucharest was for the second time attacked by hostile aeroplanes, which dropped bombs from 2 until 5 o'clock this morning. They were vigorously bombarded by the Roumanian special artillery.

"I understand that the American Government will protest against the indiscriminate throwing of bombs on Bucharest from aeroplanes.

"The injuries suffered by civilians in a previous raid have provoked a demand for reprisals."

Two days later he sent the following message:—

"A Zeppelin attacked Bucharest last night for the third time. Bombs were thrown, but little damage was caused to the surrounding houses. No serious loss is reported up to the present."

Mr. G. Ward Price, writing to the *Daily Telegraph* from Salonica on September 6th regarding the march of Col. Christodoulos, the Greek commander, to Kavalla, says:—

"Aeroplanes attacked him at Petelino, and he lost 15 men that way."

Mr. A. Beaumont, writing to the *Daily Telegraph* from Milan on September 8th, states:—

"The official bulletin last night reported another air raid on Venice, during which bombs were thrown, one falling in front of the Basilica of St. Mark and another on the British hospital, fortunately without doing any serious damage. This is a continuation of the Austrian reply to the capture of Gorizia, a worthy imitation of German vandalism in bombarding the cathedral of Rheims. The new outrage excites universal indignation in Italy. The general Press comment is that Austria is thereby, if possible, placing herself more and more outside the pale of civilised nations. Happily the beautiful and historic monument of St. Mark's escaped unscathed. But the civilised world will judge that this is warfare as understood by the Habsburg dynasty and the Austro-Hungarian Empire. Bombs cannot fall by mistake on the Piazzo of San Marco, which is too far from any military establishment to supply any kind of excuse. It is simply another evidence of the barbarian impulse to destroy everything beautiful and sacred. St. Mark's is all the world over a symbol of religion and the arts of peace, and the Austrians, by seeking to destroy it with bombs from the sky, only prove to mankind what is their true mission."

* * *

Educating M.P.s.

DOUBTLESS Members of Parliament, both Lords and Commons, will welcome the little pamphlet, "Elementary Facts about Aircraft," which Lord Montagu has prepared for their special benefit by "Private Circulation" only. Aviation has been a popular subject for debate in recent sessions, but the technical terms bandied about by the "experts" must have been quite bewildering to the ordinary member who takes but a passing interest in aircraft. Realising this, Lord Montagu has set down in simple, very simple, language just what these terms mean, and explains the elementary principles of various types of aircraft.

A Double Fatality.

AT an inquest held at Cowes on September 8th on Ralph and Allen Lashmar, brothers, who were killed in an aeroplane accident at Northwood, I.W., on September 7th, it was stated that the Government inspectors who had examined the machine since were satisfied that the mishap was not due to faulty material or construction. The wires and struts were all intact after the accident. A local farmer, who was returning from market, said when the machine was over him something "went pop," the wings dropped and the machine began to fall. A verdict was returned of "Accidental Death," no blame attaching to anyone.

Fatal Accident in France to British Pilot.

THE *Matin*, on September 8th, published the following message from Bethune: "A British pilot flying from the front landed in the marshes near Lambres in order to effect repairs. Shortly after he rose again his engine broke down, and the machine turned over and crashed to the ground. The pilot was so seriously injured that he succumbed to his injuries the following day."

An Airship Fatality.

WHILE assisting to start an airship, Charles E. Goff slipped and was caught by the aft propeller, which was turning 800 r.p.m. A verdict of "Accidental Death" was returned at the inquest on September 11th.

Disastrous Looping in Japan.

THE Japanese *Aeronautical World* records that on June 6th Capt. Oka, of the Imperial Flying Corps, accompanied by Capt. Harada, attempted to loop the loop on a new machine at the Tokorozawa aerodrome. They were unsuccessful in their first attempt, and on a second try the machine fell into a clump of trees and both pilot and passenger were severely injured.

Aeroplane on a Crowd.

WHILE flying at Miyakonojo, Miyazako, Japan, on June 10th, an aeroplane piloted by Mr. Iyeyasu Nakazawa, fell from 600 ft. on to the crowd, killing two men and injuring four. The pilot was severely injured.

An Airship in California.

AN airship, of the non-rigid type, 124 feet long and 30 feet in diameter, with a capacity of 80,000 cubic feet, is being used in Pasadena, Cal., by Messrs. Russell and Waterman, the craft being piloted by Mr. J. M. O'Connell. It carries a crew of eight men, and a speed of 30 m.p.h. is said to have been attained. A single propeller driven by a 60 h.p. Hall Scott motor, is used.

More Fables from Germany.

THE following semi-official message was sent out from Berlin on September 4th regarding the raid on September 2nd:—

"The fortress of London, the City, and the northern and north-western district were repeatedly bombed for four hours. Numerous conflagrations and collapses proved the success of the attack. Other airships attacked factories and fortifications at Norwich, where strong explosions and fires were caused. Searchlight batteries and industrial works in Oxford, Harwich, Boston, and on the Humber were bombed, and numerous fires caused there. In Yarmouth the gasworks and aerodrome were attacked, and a battery was silenced. In Nottingham the military works and factories were attacked. A fire caused here was clearly visible at a distance of 40 miles.

"During their attacks the airships were subjected to heavy artillery attacks, especially when over London. Apart from the batteries on land they were also fired on by airmen who rose in pursuit. Although light was thrown on the airships by light rockets and searchlights (one airship simultaneously came under the rays of not less than 18 searchlights) all the attacks upon them were unsuccessful."

In this connection it is officially stated that the damage done is exactly what was reported in the British *communiqué*, and that there were no conflagrations of any importance and no explosions.

New Zeppelins on Trial.

Messages from Romanshorn, Lake Constance, state that on September 4th a Zeppelin of a new type, 790 ft. long and fitted with four gondolas, was tried over the lake.

The Commander of the "L. 21."

It has now been published in Germany that the commander of the "L. 21" brought down at Cuffley, was Capt. Wilhelm Schramm, who hailed from Hamelin, in Prussia, well known through Browning's poem of the "Pied Piper." Incidentally it may be noted that it was in Transylvania, now being "redeemed" by Roumania, that the children decoyed into the hillside emerged into the light of day. Capt. Schramm had received the Iron Cross of the First Class for taking part in previous raids on England, Nancy and Dunkirk. He was one of the early workers with Majors Gross and Sperling.

Another Zeppelin Captain Killed.

Besides recording the death of Capt. Schramm, of the "L. 21," it is announced in the German Press that Capt. Walther Wolff, an airship commander, "has died for his Fatherland." This may be connected with the second airship which was so heavily damaged and was seen sinking in the North Sea. A message from Rome states that information had been received from Switzerland that two super-Zeppelins were recently lost. Good; let the thing go on.

And Another Zeppelin Reported Damaged.

Information received by the *Berlingsketidende* from Bergen last week was to the effect that steamers arriving there from the North Sea reported having seen a Zeppelin, apparently with damaged steering gear, going east. It was also reported at The Hague from the Belgian frontier that one of the Zeppelins returning from England had to land suddenly at Mons. Several members of the crew were suffering from shrapnel wounds. The airship was taken to pieces by the German troops, and the parts sent by train to Germany.

Dutch Fire on a Zeppelin.

According to the *Times* correspondent, writing from Amsterdam on September 8th, a Zeppelin flew over the island of Schiermonnikoog, on the north coast of Holland, that morning at a very low elevation. It was fired upon by the guns stationed there. One shot was thought to have hit the airship near the rudder, but this does not seem likely, for the Zeppelin, which was enveloped in clouds of smoke, rose to a greater height and disappeared in a north-easterly direction.

Two Fire Stories from Germany.

Two strange stories regarding fires at aircraft works in Germany have come through Copenhagen recently. According to the first the Adlerhof Works, near Berlin, are said to have been destroyed, and 10 complete aeroplanes are reported to have been burnt up and a great number damaged. Another report, via Rotterdam, puts the number destroyed at 22, and adds that the fire is believed to have had a criminal origin.

The second story is to the effect that a large airship wharf near Frankfort has been burnt to the ground, together with four large Zeppelins and 15 aeroplanes. In this connection it may be recalled that the Schütte-Lanz works are at Rheinau, Baden, about 40 miles from Frankfort-on-Main.

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The Navarro Aircraft Co.

A new recruit to the ranks of the industry is the Navarro Aircraft Co., who have taken works at Burton-on-Trent, and are open to undertake the building of aircraft either complete or parts. They also have a department for the production of small metal fittings, &c. Their London Office is at 86, Gray's Inn Road, Holborn, W.C.

For Aircraft Fittings.

Those who are in the market for small aircraft fittings, such as washers, wire strainers, ferrules, thimbles, &c., should make a note of the fact that Messrs. Whiteman and Moss, of 15, Bateman Street, Dean Street, W., who have specialised in this department for several years. offer immediate delivery of such fittings in the usual sizes. That the fittings are up to the Government standard is shown by the fact that the firm are contractors to the Admiralty and the War Office.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

The Ascham Model Ae.C. (36, Phipson Road, Sparkhill, Birmingham).

Monthly Report.—Not as much work as was anticipated was put in last month owing to high winds, rain, &c., but the flying meetings held on Billesley Common, although small, came off comparatively well. Aug. 5th: S. Whitley was out with his r.o.g. twin-pusher Blériot-Canard monoplane, putting up excellent flights at a good altitude, landing well. R. Field made several good flights with his r.o.g. twin-pusher monoplane, as did S. Mitchell with his twin-pusher and tractor monoplane, the latter getting off very quickly. Aug. 12th: S. Mitchell and H. R. Simmons out with twin-pushers; the former executed three loops during a flight with the latter's machine. Aug. 19th: Rain severely hampered the proceedings, consequently few members turned up. However, although it was late evening, S. Whitley, H. R. Simmons, and S. Mitchell put up several good flights, the machines behaving very well in the choppy wind. During the month work has been continued in the workshop, where Mr. Whitley, senior, has been engaged in building a one-and-a-half plane and a tractor monoplane with sectional planes. S. Mitchell made good progress with his twin pusher r.o.g. biplane. The membership is at present rather low, members having joined the Colours. Those wishing to join this club should apply to the hon. secretary at the above address. Since writing these lines we hear that S. Whitley has joined the R.F.C.

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COMPANY MATTERS.

The Stock Exchange Committee has given permission for dealings in Aircraft Manufacturing Co. 7 per cent. cumulative preference shares after the allotment letters have been issued.

NEW COMPANY REGISTERED.

CAMBRIDGE SCHOOL OF FLYING AND AERODROME CO., LTD.—Capital £5,000, in £1 shares. First directors, F. Ruffy, W. F. Hardesty, G. F. Joseph, and H. Franklin.

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IMPORTS AND EXPORTS, 1915-1916.

Aeroplanes, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "Flight" for January 25th, 1912; for 1912 and 1913, see "Flight" for January 17th, 1914; for 1914, see "Flight" for January 15th, 1915; and for 1915, see "Flight" for January 13th, 1916:—

	Imports.		Exports.		Re-Exportation.	
	1915.	1916.	1915.	1916.	1915.	1916.
	£	£	£	£	£	£
January ...	20,382	1,509	435	6,399	13,706	—
February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	59,287	2,400	—
July ...	1,240	2,072	13,372	12,932	—	—
August ...	664	2,583	36,276	13,555	247	420
	30,782	26,351	97,685	180,511	48,791	4,510

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Aeronautical Patents Published.

Applied for in 1915.

Published August 31st, 1916.

13,591. G. J. Money. Indication mark for assisting aircraft to alight by night, and means of communication whilst in flight.
14,469. M. O. Illingworth. Lanterns for aircraft.
14,578. Sunbeam Motor Car Co. and L. Coatalen. Aeroplane driving mechanism.
14,601. J. S. Parker. Travelling conveyers for use with kites, &c.

Published September 14th, 1916.

8,070. J. E. Chandler. Sighting devices for use on aircraft.
14,670. E. M. Knowles. Propellers for aeroplanes, &c.

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First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER.

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 404. (No. 38, Vol. VIII.)] SEPTEMBER 21, 1916. [Weekly, Price 1d. Post Free, 1½d.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

"Tanks."

WHILE we were admittedly caught unprepared in armament and equipment at the outbreak of war, even the Germans must now admit that we have to the full risen to the occasion. For 40 years Germany had impressed into her preparations for war all the manifold resources of engineering and chemical science, while we stood on one side and watched with arms figuratively folded, at least so far as our land services were concerned. But since the fateful August of two years ago we have indeed made enormous advances in invention and equipment for the ungentle art of war, and more than one have been the surprises sprung upon the common enemy. Of some we cannot speak until the end of the war removes the embargo on speech and writing; but of the latest, "Tanks," it is possible to speak now with some amount of freedom. There is no need to again traverse the ground covered by the story of their first appearance on the Somme, where they certainly gave the Germans one of the major surprises of the war, and, incidentally, at the same time disproved the prevalent idea that we cannot keep a secret from the German intelligence system. The fact that these new engines of war were in process of construction was known to many, and yet not a whisper got abroad, and the general mass of the public knew no more about the great surprise preparing than the enemy himself.

The credit for the inception of these vehicles belongs to the Royal Navy. It is a matter of history that it was the Royal Naval Air Service which pioneered the armoured car, and it was under the Navy that its possibilities were demonstrated in France and Belgium and in South-West and East Africa. The earlier types were admittedly in the nature of a compromise. Armoured cars did not exist in the British service when war broke out, and no experimental work had been done in the direction of evolving a fighting car for the purposes of war. Therefore, the best that could be done was to adapt the best obtainable touring chassis to carry armour and guns. Later, the type developed somewhat, and we had the heavy armoured lorry, capable of carrying heavier metal, though moving necessarily at a slower speed.

Both these types did well, but, as has already been said, they were compromises designed more to fill a gap than to be of a permanent character. Therefore, much experimental work was inaugurated and carried on along the lines of the present "Tanks." This experimental work received the enthusiastic support of Mr. Winston Churchill, First Lord of the Admiralty, and of Commodore Sueter, then Director of the Air Department, who may justly be described as the pioneer of the armoured car in the British service. As he pioneered the submarine and the aeroplane, so he threw himself heart and soul into the development of the armoured car. Thus it came about that when, a little more than a year ago, it was decided from motives of policy that the Army should take over the armoured car, the new design was practically past the experimental stage.

As to who was actually the first man to promulgate the idea of these "Tanks," together with drawings, &c. is another matter.

It was fortunate that so able and progressive an officer as Col. Swinton should have been detailed to handle the new arm and give practical effect to the work that had been done under the ægis of the Admiralty, and that he should have been ably seconded by others like Major Stern and Capt. Symes, who had been closely associated with Commodore Sueter in the development of the fighting car since the early days of the war.

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Who Conceived the "Tanks"?

Since Sir Douglas Haig reported on the extraordinary success achieved by the "Tanks," the whole Press of the country has been busy awarding the credit of their conception to endless people. Everyone who has been even remotely connected with their development has been awarded praise. Mr. Winston Churchill, who was at the Admiralty when the "Tank" experiments were inaugurated; Col. Swinton, who took over the direction of the practically completed experiments when the Armoured Car Division was handed over to the Army; and half-a-dozen others have been named, but no one appears to have remembered—if, indeed they knew—that the first suggestion of employing the type for fighting came from Lieut. Macfie, who in the early days of aviation was prominently identified with the movement. The full story cannot be told now. It is one of those that must remain untold till the end of the war. As we have noted above, Mr. Churchill and Commodore Sueter gave every encouragement to the idea of adapting a particular form of traction to armoured car purposes, but credit where credit is due. It was Macfie who first urged the suitability of the type.

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How Neutrals Hear the "Truth."

The *Daily Mail* has been unmasked! We have it on the authority of the *Vossische Zeitung* that our contemporary always prints two editions. One contains the truth, for home consumption; the other, pretty articles to impress the neutrals. Apparently, it is the edition for neutrals that has been reaching the Editorial breakfast table, for we have remained in ignorance up to now of the destruction of the Houses of Parliament, among other fearful havoc, which the truthful edition of the *Mail* tells us all about. No wonder we live in a fool's paradise, when our leading journals suppress the truth in this double-handed way, so to speak.

Seriously, though, the Germans must be feeling the pinch pretty badly when they are reduced to perpetrating forgeries of our daily journals to get their own people and those of neutral countries to believe their mendacities relating to their abortive air raids on England. We take it they are quite prepared for the post-war results of their methods? One result of these must inevitably be that no one will ever take the word of a "Hunzollern," even though it were backed by all the affidavits ever sworn. They must go through history branded as a nation of liars, with whom no decent man may have dealings save at his peril.

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Prize Money for Zepp. Destroyers.

The *Investors' Guardian* of the 9th inst. makes the interesting suggestion that the Naval system of awarding prize-money should be extended to the air services. The contention put forward in support of the idea is, it is only right and proper when the skill and daring required for the successful dealing in the air with the Zeppelin menance are taken into account, some tangible mark of the country's appreciation should be awarded. The *Investors' Guardian* assesses that appreciation at £1,000. There are arguments for and against. In the first place, it has to be noted that the suggested reward would take the shape of a purely personal gratuity, differing thereby from the Naval system, in which the prize-money is shared by all concerned in the deed for which it is awarded. If the system were to be logically carried out, the prize-money would have to be divided *pro rata* among everyone concerned, in which case the sum noted would not go very far. If, however, it is to be purely a personal gratuity to the aviator who actually is fortunate enough to deal the *coup de grace* to an airship which has been previously disabled either by gunfire or by bombing by a less fortunate airman, then the incidence of the reward would scarcely be fair.

All are in favour of recognising—and recognising handsomely—the superlative gallantry of our flying services, but we confess we are rather at a loss to see how in this matter justice can be done to one without the risk of injustice to others. Probably the best method of dealing with the question would be to authorise the allocation of so much prize-money for the destruction of enemy aircraft, to be granted or not in the discretion of the competent authorities, and, if granted, to be allocated as decided by them. But whatever shape the idea may or may not ultimately take, the question is at least one that will bear examination.

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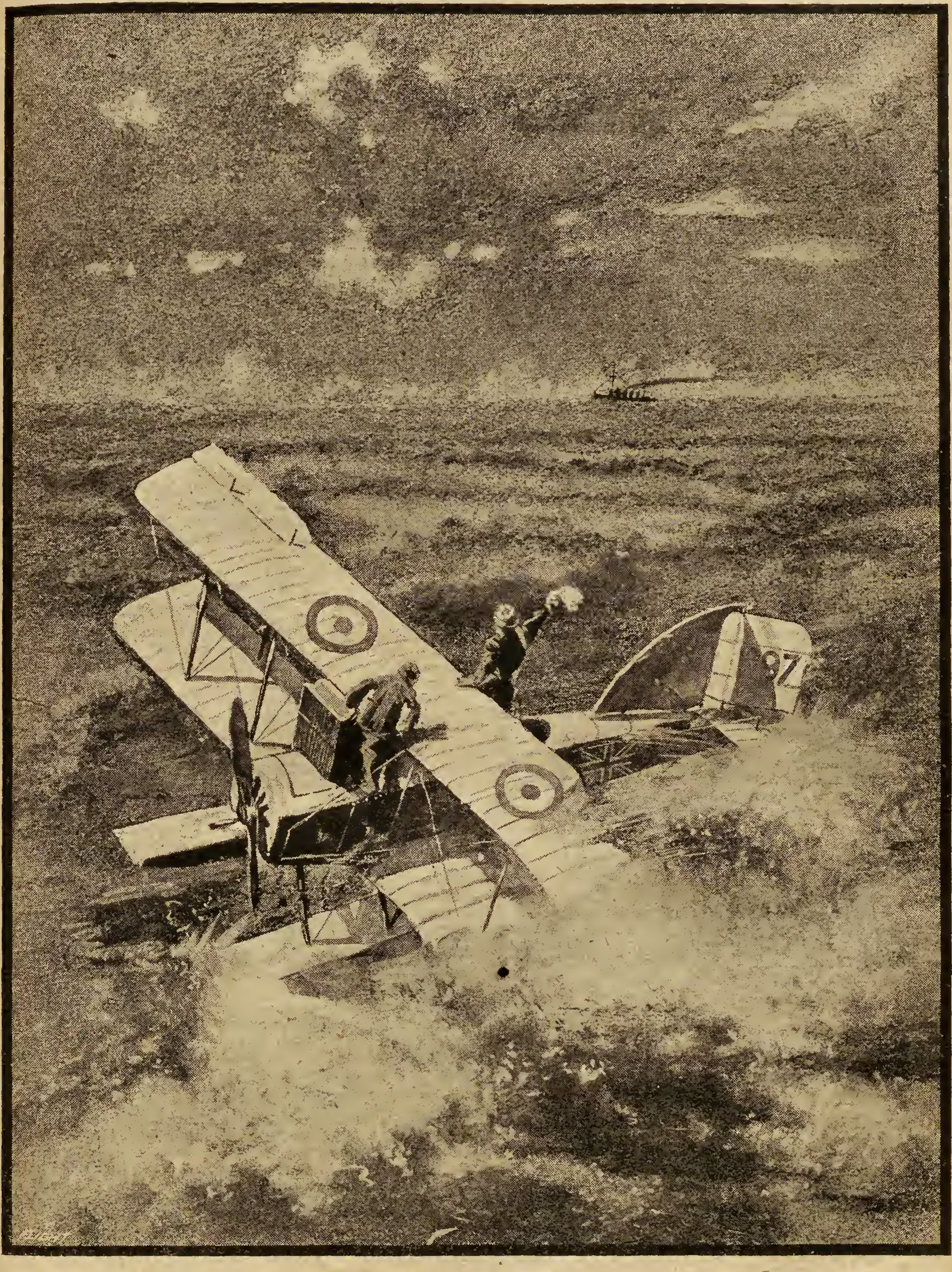
New Prizes for Zepp. Strafers.

A prize of £500 has been offered by Mr. J. W. Isherwood, the inventor of the system of ship construction bearing his name, to the next aviator to bring down a Zeppelin on British soil.

A similar prize has also been put up by Commander Sir Edward Nicholl, R.N.V.R., of Cardiff.



GUARDING OUR COASTS.—A naval patrol in difficulties in the North Sea.

The British Air Services

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared in the *London Gazette* of September 12th :—

Temporary Lieut. H. Jullerot, R.N.V.R., is to be Honorary Flight-Lieutenant; Aug. 4th, 1916, and not Temporary Flight-Lieutenant as previously stated.

The following appeared among the Admiralty announcements of September 13th :—

Mr. H. L. F. McLean entered as Probationary Flight-Sub-Lieutenant (Temporary), seniority June 7th, and appointed to "President," additional, for R.N.A.S. The following have been entered as Probationary Flight Officers (Temporary), seniority Sept. 17th, and appointed to "President," additional, for R.N.A.S.: Lieut. (Temporary, R.N.V.R.) L. G. Wright, Sub-Lieut. (Temporary, R.N.V.R.) M. H. Rattray, Air-Mechanics W. L. Jordan and F. G. Horstmann, Leading Mechanic A. M. O. McLachlan and Second Lieut. (12th R. Warw. R.) K. V. Stratton.

The following appeared among the Admiralty announcements of September 14th :—

A. D. Carey entered as Probationary Flight Officer (Temporary), seniority Sept. 24th, and appointed to "President," additional, for R.N.A.S.

The following appeared among the Admiralty announcements of September 16th :—

Lieut.-Com. H. N. M. Hardy, D.S.O., graded as Flight Commander, to date Sept. 15th.

Messrs. J. T. Clutty and E. A. B. Tooth granted temporary commissions as Sub-Lieutenants, R.N.V.R., with seniority Sept. 15th.

The following have been entered as Probationary Flight Officers, for temporary service, all to date Sept. 17th: H. W. Badman, D. Balmain, C. R. Derington-Turner, W. J. Coast, P. B. Silk, C. L. Price, E. N. Jaquin, E. F. Burrowes, J. W. Beebee and R. G. Saunders.

Petty Officer (R.N.A.S.) A. E. Watson granted temporary commission as Engineer Sub-Lieutenant, R.N.R., with seniority Sept. 12th.

The following appeared among the Admiralty announcements of September 18th :—

The following have been granted temporary commissions, R.N.V.R., seniority Sept. 16th, and all appointed to "President," additional, for R.N.A.S.: Lieuts. S. W. Godin and J. G. Dothie; Sub-Lieuts. L. Marsh and R. Redfern.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of September 12th :—

Temporary Appointments made at the War Office.

Staff Lieutenant.—Temporary Second Lieut. H. Cumming, General List, from an Assistant Equipment Officer, R.F.C., vice Second Lieut. H. J. de C. Moore, Special Reserve; Aug. 29th, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 13th :—

Experimental Officers (graded as Equipment Officers).—July 9th, 1916: Capt. R. B. Bourdillon, Special Reserve from an Assistant Equipment Officer; Lieut. B. M. Jones, R.E. (T.F.), and to be Temporary Captain whilst so employed. (Substituted for notification in the *Gazette* of Aug. 24th, 1916.)

Assistant Equipment Officer.—Second Lieut. G. B. Redgrave, Special Reserve; Sept. 4th, 1916.

Memorandum.—Temporary Second Lieut. S. T. Welch, General List, relinquishes his commission on ceasing to be employed with R.F.C.; Sept. 14th, 1916.

Supplementary to Regular Corps.—Second Lieut. (on probation) T. R. Hancock resigns his commission; Sept. 14th, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 14th :—

Flight Commander.—Temporary Second Lieut. M. D. Barber, General List, from a Flying Officer, and to be Temporary Captain whilst so employed; Aug. 21st, 1916.

Flying Officers.—Second Lieut. O. T. Sloan, Sco. Rif (T.F.); July 2nd, 1916. Aug. 16th, 1916: Lieut. J. W. Warren, Canadian General List; Temporary Second Lieut. J. L. B. Baggs, Welsh R., and to be transferred to the General List; Second Lieut. C. D. Bennett, Special Reserve. Temporary Second Lieut. A. B. Raymond Barker, General List; Aug. 18th, 1916. Aug. 19th, 1916: Second Lieutenants, Special Reserve: I. B. Hart-Davies, S. C. Maytom, F. L. Luxmoore. Second Lieut. W. R. D. Shaw, 7th Essex R. (T.F.), to relinquish his appointment; Aug. 21st, 1916.

Flying Officers (Observers).—Temporary Lieut. E. L. Williams, E. York R., and to be transferred to the General List; March 4th, 1916. Aug. 25th, 1916: Temporary Lieut. F. L. B. Hebbert, R.A., and to be transferred to the General List; Temporary Lieut. R. Johnstone, R.A., and to be transferred to the General List. Temporary Second Lieut. F. Sharpe, Notts and Derby R.; Temporary Second Lieut. H. Brereton, L'pool R., and to be transferred to the General List; Aug. 26th, 1916. Aug. 27th, 1916: Lieut. (Temporary Capt.) J. S. G. Collie, R.F.A. (T.F.); Lieut. (Temporary Capt.) K. A. Brooke Murray, A.S.C.

Balloon Officers.—Aug. 12th, 1916: Temporary Second Lieut. F. L. Simmons, R.W. Surr. R., and to be transferred to the General List; Temporary Second Lieut. W. G. Dreschfeld, Bord. R., and to be transferred to the General List; Temporary Second Lieut. H. Thrower, Arg. and Suth'd Highrs., and to be transferred to the General List; Temporary Second Lieut. H. S. Goodliffe, Notts and Derby R., and to be transferred to the General List; Temporary Second Lieut. C. H. Davies, E. K. R., and to be transferred to the General List; Second Lieut. (on probation) D. C. Bauer, Special Reserve; Temporary Second Lieut. C. W. Berry, General List. Second Lieutenants, Special Reserve: F. C. Mears, H. B. T. Hawkins, C. Clarke. T. G. G. Bolitho, from an Assistant Equipment Officer; Aug. 23rd, 1916.

Assistant Equipment Officers.—Second Lieut. (on probation) J. H. Robertson, Special Reserve; May 25th, 1916. Temporary Second Lieut. J. H. B. Burgess, General List; July 10th, 1916. Second Lieut. (on probation) F. C. Thomas, Special Reserve; July 16th, 1916. Second Lieut. (on probation) G. B. Wilkins, Special Reserve; July 19th, 1916. Aug. 1st, 1916: Second Lieut. D. B. James, Special Reserve, from a Balloon Officer; Second Lieut. C. N. Dore, Special Reserve; Second Lieut. H. G. Gibbs, special Reserve; Second Lieut. (on probation) W. H. Trinder, Special Reserve. Temporary Second Lieut. W. H. Rose, General List; Aug. 14th, 1916. Second Lieut. (on probation) J. R. Hembrough, Special Reserve; Aug. 19th, 1916. Aug. 22nd, 1916: Lieut. (Temporary Capt.) A. H. Guerrier, 3rd Co. of Lond. Yeo. (T.F.); Temporary Lieut. C. C. Barrett, 3rd Bn. British West Indies Regt., and to be transferred to General List. Temporary Second Lieut. G. E. Phillips, General List; Aug. 31st, 1916.

Memoranda.—Temporary Lieut. L. S. Williams, General List, relinquishes his commission on ceasing to be employed with R.F.C.; Sept. 15th, 1916.

The following to be Temporary Lieutenants, for duty with R.F.C.: Corpl. D. M. Macdonald, from 3rd Canadian Training Brig.; Aug. 19th, 1916. Act.-Sergt. J. M. Atherton, from 9th Bn. Australian Imperial Force; Aug. 31st, 1916. Sept. 4th, 1916: Sergt. R. G. R. Townsend, from Blundell's Sch. O.T.C.; Pte. H. Rosselli, from H.A.C. (T.F.); Pte. G. W. P. Davidson, from Canadian A.S.C.

The following to be Temporary Second Lieutenants (on probation) for duty with R.F.C.:—Sept. 5th, 1916: S. F. Allabarton, L. E. Baker, W. R. Balden, A. J. Chapman, H. R. Child, A. E. Gay, J. S. Green, A. G. Harrison, J. A. Inman, B. C. Jones, T. J. Kent, S. G. Knock, E. Marsden, F. Matthews, J. Nightingale, H. Roberts, A. A. Shaw, B. J. Silly, C. T. E. Smith, P. Tew, A. Appleby, H. C. H. Cooper. P. Evans, W. H. Gunner, E. D. Inskip, W. G. Milliship, J. H. Mitchell, A. V. Pearman, H. G. Tucker, D. J. W. Walker,

R. G. Weller, W. Woodward, A. C. Finlayson, T. B. Fraser, R. Littlejohn, A. D. Napier, D. W. L. Young. R. G. Clough, W. Coltman, A. E. Franklin, A. W. Gardner, D. Gordon, P. Haselock, H. J. Hinde, A. B. Jones, J. S. Leslie, N. E. Maitland, G. H. Palmer, R. B. Salisbury, H. Shaw, W. P. T. Watts, G. A. B. Wheldon, A. S. White, R. Applin, R. W. Binder, H. G. Downing, A. F. Elliott, J. H. Flynn, H. T. Garrett, J. F. Grose, E. Holman, R. E. Jeffery, C. G. Larkin, H. V. Long, H. G. Neville, F. A. W. Mann, Iowerth ap R. Owen, A. B. Peters, E. D. Soar, R. S. Twigg, R. P. O. Weekes, J. H. Westlake, H. G. Wood, R. W. T. Bodilly, L. E. Lomas, P. H. B. Ward, J. R. Wilson, L. J. Bailey, F. E. Bishop, E. Brewer, J. W. Brown, F. P. Brown, A. L. Ballard, A. B. Bullock, R. S. Davies, N. H. Dimmock, C. F. Frank, G. F. Hunter, A. V. Hurley, E. A. James, P. G. Kelsey, A. F. Kemp, E. R. Law, R. F. Malabar, A. L. Messenger, B. Ord, R. W. Redding, A. I. Riley, J. K. Ross, S. A. Salmon, F. L. Smith, H. F. Walker, H. E. Waters, E. D. Whittles, C. E. Worthington, T. F. Braines, L. Cable, H. Cooke-Smith and L. S. R. Poole.

The following appeared in the *London Gazette* of September 15th :—

Flying Officers.—Aug. 16th, 1916: Temporary Second Lieutenants, General List: G. C Body, F. P. Kane, I. V. Pyott. Second Lieut. (on probation) M. C. Mossop, Special Reserve. Second Lieut. (Temporary Lieut.) R. Corbett, W. Som. Yeo. (T.F.), from a Flying Officer (Observer). Aug. 17th, 1916. Second Lieutenants (on probation), Special Reserve. Aug. 19th, *1916* : H. H. Griffith, G. W. Dampier. Temporary Second Lieutenants, General List: C. C. Gibbs and G. F. Lines

Flying Officer (*Observer*).—Temporary Second Lieut. D. K. Paris, R.A., and to be transferred to the General List; June 1st, 1916.

Memorandum.—Temporary Second Lieut. D. H. Broughton, General List, relinquishes his commission on ceasing to be employed with R.F.C.; Aug. 31st, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 16th :—

Park Commander.—Capt. T. E. Robertson, Special Reserve, from an Equipment Officer, and to be Temporary Major whilst so employed; Sept. 1st, 1916.

Supplementary to Regular Corps.—The under-mentioned Second Lieutenants (on probation) are confirmed in their rank: S. M. Baber, A. W. Grigsby, F. W. Roberts, D. C. Bauer. The under-mentioned to be Second Lieutenants :—July 1st, 1916 : E. G. Boulenger, L. S. S. Northcote.

The following appeared in a supplement to the *London Gazette* issued on September 18th :—

Memoranda.—The appointment of 2nd Class Air-Mechanic A. H. Bates to be Temporary Second Lieutenant, notified in the *Gazette* of Aug. 24th, 1916, is cancelled.

To be Temporary Second Lieutenants for duty with R.F.C.: Cadet T. Huggan, from Marlborough Coll. O.T.C.; Sept. 16th, 1916. Sept. 18th, 1916: Corpl. B. O. Angell, from Artists'Rifles O.T.C.; Cadet A.B. Cort, from Notts Univ.O.T.C.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: M. C. Mossop, H. H. Griffith, N. A. Phillips and R. C. M. Smith.

George W. A. Brown to be Second Lieutenant; Aug. 14th, 1916.

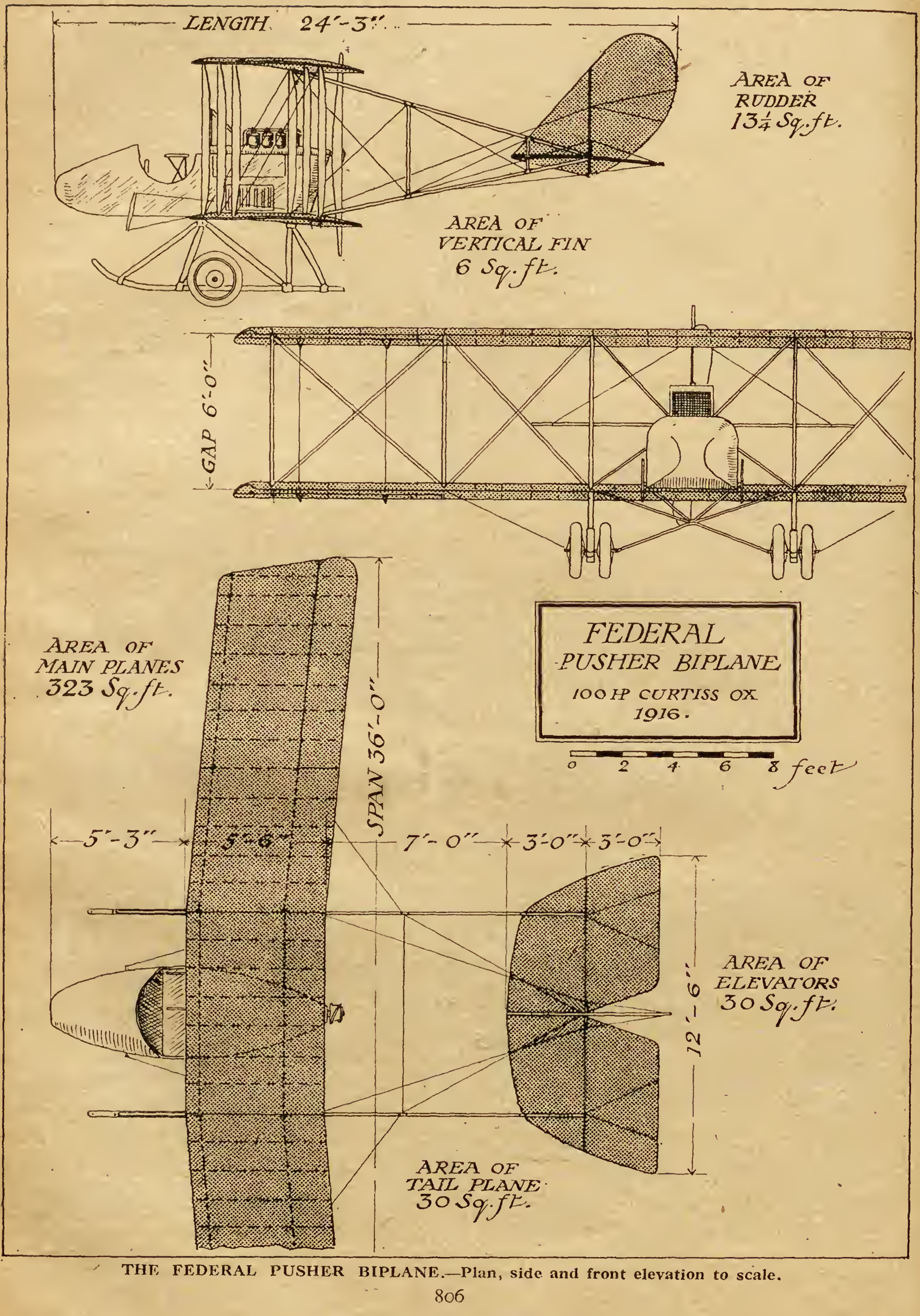
To be Second Lieutenants (on probation) :—Sept. 4th, 1916: G. D. Thane-Parker, C. G. Mallous, S. F. Brown. Sept. 18th, *1916* : F. R. L. Taylor, C. C. Villa, H. Seymour, S. Roche, E. H. Dimmock, J. B. Thomas and G. C. Morris.

Royal Flying Corps (Territorial Force).

The following appeared in a supplement to the *London Gazette* issued on September 18th :—

Hampshire Aircraft Parks.—S. M. S. Blackman to be Second Lieutenant; Sept. 19th, 1916.

ON THE FRONT IN FRANCE.—An observation balloon coming to earth. Note the lines of trenches stretching away in the far distance, barbed wire, &c. (*Official photo. issued by the Press Bureau.*)


LENGTH 24'-3"
AREA OF RUDDER 13¼ Sq.ft.
AREA OF VERTICAL FIN 6 Sq.ft.
GAP 6'-0"
AREA OF MAIN PLANES 323 Sq.ft.
SPAN 36'-0"
FEDERAL PUSHER BIPLANE
100 HP CURTISS OX
1916.
0 2 4 6 8 feet
5'-3"
5'-6"
7'-0"
3'-0"
3'-0"
AREA OF ELEVATORS 30 Sq.ft.
12'-6"
AREA OF TAIL PLANE 30 Sq.ft.

THE FEDERAL PUSHER BIPLANE.—Plan, side and front elevation to scale.

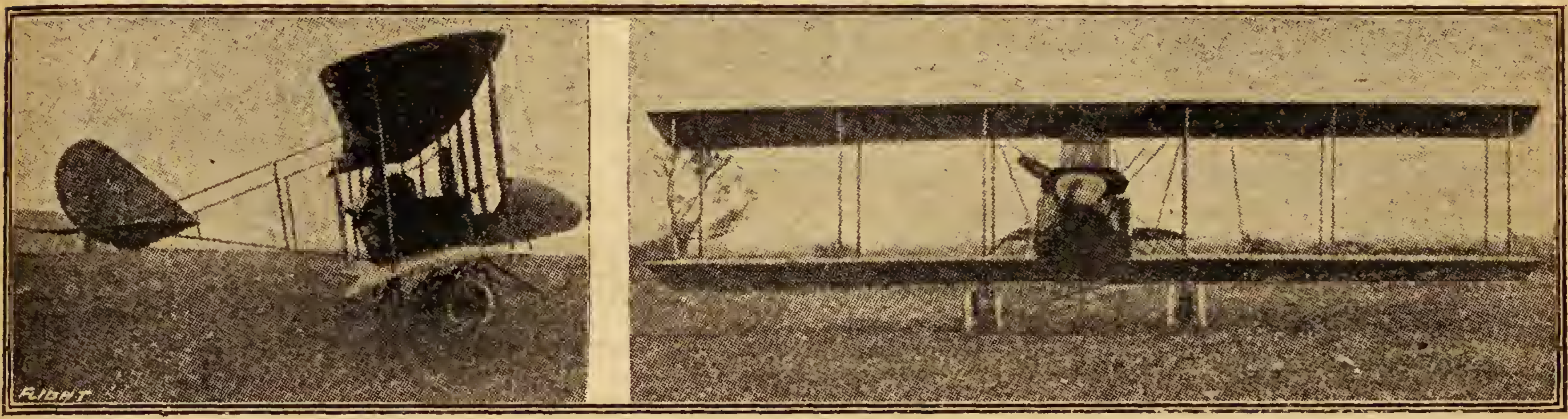
THE FEDERAL PUSHER BIPLANE.

ONE of the latest recruits to the aeronautical industry in America is the Federal Aircraft and Motor Corporation of New York, which has been formed for the purpose, not only of manufacturing machines of various types to their own designs, but with a view of conducting a flying school at New York City. The machines in use for this latter branch include a Curtiss flying boat and a Martin tractor, as well as a 100 h.p. pusher biplane of the Company's own design, which is shown in the accompanying illustrations and scale drawings.

As may be seen, this machine possesses several distinctive features, notably the swept-back planes and the "armoured" stream-line *nacelle*. The latter is mounted on the top of the lower plane, and is built up of ash, covered with sheet steel, which covering is given a finish of black enamel with vermilion lines. The cockpit, seating pilot and passenger side by side, is just forward of the planes, giving an excellent view, and the seats are upholstered with "Ianasilk" cushions, which are capable of sustaining the weight of two men in water, should a forced descent be made on the latter. Two fuel tanks, each having a capacity of 21 gallons, or sufficient for 4½ hours' flight, are fitted one on either side of the engine—a 100 h.p. Curtiss OX—which is mounted in the rear of the *nacelle*. Roomy lockers are provided under the seats for tools, spares, &c., so that minor repairs or adjustments may be effected on the spot. The radiator is mounted on the top of the *nacelle* just in front of the engine. It is proposed to instal in future models a new engine with which the Federal Co. have been carrying out extensive tests. The Curtiss shoulder-yoke type of control is fitted, in which an ingenious arrangement is incorporated whereby dual control for either of the three operations—rudder, elevator and *ailerons*—may be installed separately or all together by the fastening of four nuts and a bolt. By this means the pupil can become accustomed to the controls one at a time.

Top and bottom planes, which have a span of 36 ft., are made up of three panel sections, the centre section measuring 8 ft. span and the two outer ones being slightly swept back, and thus giving the machine a certain amount of inherent stability. Each surface is built up of two main spars of specially selected ash, and ribs of spruce, the whole framework being braced and covered with Irish linen doped with five coats of aero varnish and three coats of Valspar. Upper and lower surfaces are separated by six pairs of streamlined mahogany struts, the fittings of which—as with all other fittings throughout the machine—being of sheet steel stamped out in one piece. Roebling steel cable is used for the bracing throughout, and quick-release connections are used extensively. *Ailerons* are hinged to the outer extremities of the rear spars of both top and bottom planes.

The outriggers carrying the tail are of 1-inch steel tube filled with spruce, the spacing struts being of oval section steel tubing secured to the outriggers by stamped steel clips. The tail planes consist of a non-lifting stabilising surface of about 30 sq. ft., to the trailing edge of which are hinged two elevator flaps of 15 sq. ft. each, and a large rudder hinged to a triangular vertical fin. The landing chassis is of the Farman-Wright type, with a pair of 26 by 4 in. wheels to each skid. It is strongly braced by steel tubing.



Side and front views of the Federal pusher biplane.

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The Remains of "L. 21."

DURING next week the general public will have an opportunity of viewing the most interesting of the remains which were rescued from the wreck of the "L. 21," together with a Fokker monoplane. It was found impossible to arrange for the exhibition at the Guildhall, the Mansion House or the Royal Exchange, but by the generosity of the Lord Mayor, Sir Charles Cheers Wakefield, who is defraying all expenses, it is to be held in the grounds of the Honourable Artillery Company in Bunhill Row. The Lord Mayor will open the exhibition on Monday, and it will be open to the public on the following days from 8 a.m. to 8 p.m.

There will be no charge for admission, but collecting boxes will be placed in the tent for the City of London branch of the British Red Cross Society and the Kitchener Memorial Fund.

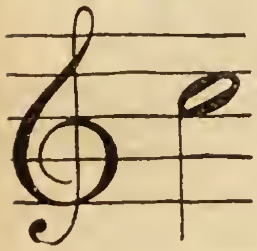
Airships and the Duty of the Public.

A FRESH order issued by Major-General Sir Francis Lloyd, the military authority for the London District, directs that all wreckage of airships, bombs, &c., shall be reported immediately to the nearest military or police authorities.

Sir Francis says "it is a matter of great importance to the naval and military services that they should always be placed in possession of all available information concerning the enemy's aircraft and the projectiles which are employed."

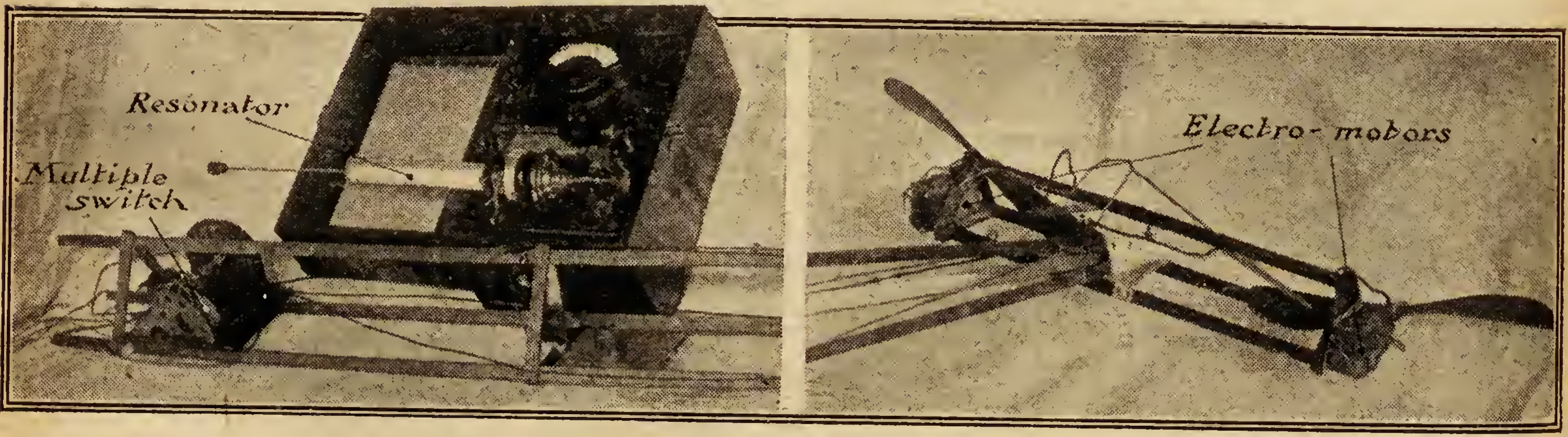
A warning is given that unexploded bombs should not be touched.

DISTANT CONTROL OF AIRCRAFT BY WHISTLING.



The note is no sooner sounded than its resonant echo becomes audible and is followed immediately by the faint whirring of two little electric motors mounted in the nose of the framework of the model airship. Again the note is sounded and the motor on the left stops, while that on the right continues to revolve. Once more that mysterious note, gentle as the tuning of a stringed instrument on which the sordino has already been placed, and the right-hand motor ceases its whir while that on the left takes up the work. Soft as it is, the note when again sounded stops both front motors and starts a third motor, having its propeller axis vertical for ascending and descending. Simultaneously a small weight, representing a bomb, is released by means of a trap door and falls clattering to the floor of the room in which we are witnessing the demonstration. A last note, and all the machinery comes to a standstill and everything is quiet. We look up and meet several pairs of eyes in which are mingled surprise and incredulity, strangely reflecting our own feelings. The only pair of eyes in that room which do not indicate the same frame of mind are those of the inventor, who calmly approaches us with a slightly amused look on his face and proceeds to explain " how it is done."

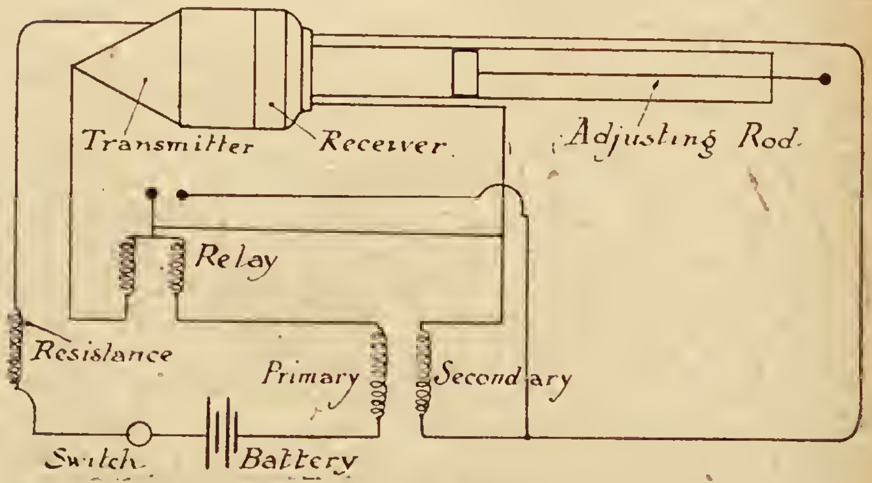
Mr. Alban J. Roberts, of Sydney, might very well be termed the Edison of Australia. Still a young man, he has been engaged for a number of years on electrical engineering in all its branches, notably on the principles of telegraphy and telephony, wireless and otherwise. He has experimented in Australia, India and America, as well as in this country, where he sent out wireless messages as long ago as in 1908 from a balloon. He still owns a small dirigible airship, stationed out in Australia, on which he goes for an occasional cruise when his travels take him to that part of the globe. Some years ago, it may be remembered, Mr. Roberts had a small model airship, controlled by wireless, which he demonstrated at the "Halls."



Framework of the model airship on which the Roberts resonator was demonstrated. The third motor, driving a propeller with its axis vertical, is not shown in the illustration.

Since then he has developed a new method of distant control, which is, he considers, a great improvement on the wireless method, since it may be so arranged as to absolutely prevent interference by " unauthorised persons." The natural interpretation of the latter term under present conditions is, of course, " enemies." Before proceeding to indicate the nature of Mr. Roberts's latest invention, it may be well to point out that distant control of aircraft is only one out of a great number of applications of which the instrument is capable. In fact, using it for this particular purpose is, perhaps, in the inventor's mind merely a minor " side line," fraught with possibilities as it would appear to be.

Briefly speaking, Mr. Roberts makes use, in his device, of the well-known principle of resonance, which will be familiar to most of our readers. Those not already acquainted with it may demonstrate it by the very simple experiment of pressing down the " loud " pedal of a piano and playing a note on some other instrument—a violin, for instance. The corresponding note will then sound on the piano.



Wiring diagram of the Roberts resonator as applied to the control of aircraft.

The Roberts resonator consists fundamentally of a telephone transmitter and receiver, facing one another and placed a short distance apart, the space between them being enclosed in a cylindrical casing which confines the air, thus amplifying the reaction between transmitter and receiver. To the back of the receiver is attached a tube in which works a piston operated by a short rod. By moving the piston in and out the length of the air column behind the receiver is changed, and consequently the note emitted when the diaphragms of transmitter and receiver are vibrated is altered correspondingly. The principle of the whole arrangement will be better and more easily understood by reference to the accompanying diagram. The telephone transmitter is coupled to the primary current and the receiver to the secondary current. From one of the terminals of the transmitter a wire runs through a suitable resistance, to a switch, hence through a battery, through the primary circuit of an induction coil, to an ordinary post office relay, and from there back to the second terminal of the transmitter. The wiring from the receiver is, it will be seen, connected up to the secondary circuit of the induction coil. When the armature of the relay moves over it provides short circuiting by the two wires shown in the diagram running to each side of the secondary coil.

It will now be seen that when the diaphragms of the transmitter and receiver are vibrated by the proper note, determined by the position of the piston in the tube, and no other note will cause them to vibrate, the relay is brought into play and closes the local current which may then be used, *via* suitable means, of course, for starting or stopping an engine, operating control surfaces, releasing bombs, &c.

In the model framework of a dirigible on which the principle of distant control was demonstrated, there were, as we have already indicated, three small electromotors, each driving a propeller. As demonstrated the sequence of operation of the three motors was, in fact, predetermined by reason of the multiple switch employed for throwing them into gear, the same note being used for initiating the control of all the motors. When rigged up for actual use on aircraft each motor and movement would have its particular note, so that no fixed sequence would have to be followed. Thus, for instance, one note would correspond to right rudder, one to left rudder; one to elevating, one to depressing; one to accelerating the engine, and one to throttling it down. In this way any evolution of an aircraft could be controlled from the ground, the necessary notes being produced by some suitable instrument, as, for instance, a siren, in which the note could be altered by varying the speed of the siren. Care would, of course, have to be taken that no note likely to be produced on board the aircraft itself, either by the engines or by the bracing wires humming in the current of air, was employed for control. In fact, there seems to be no reason why notes of such a pitch as to be inaudible to the human ear should not be employed.

On the model demonstrated to us it was possible to set the machinery in motion by running up and down the scale until the right note was found. The inventor claims, however, that it would be a very simple matter to arrange a combination whereby it would be necessary to sound the given note, not once but several times, with predetermined intervals, before the result was obtained, thus providing in effect an equivalent to the combinations used on safes, and absolutely preventing outside interference. It is mainly in this respect, we understand, that Mr. Roberts claims superiority of the resonance method over the wireless system, in which latter a coherer must be used, and which is therefore open to the criticism that it may comparatively easily be interfered with.

As regards the practical utility of this very ingenious device to aircraft work, the number of forms this might take appear to be legion, and although many difficulties suggest themselves, doubtless they can be overcome. Even if they cannot, that does not detract in the least from the ingeniousness of the device. The inventor has, as already mentioned, ample scope for the application of the device to other fields of engineering. Thus, for instance, for telegraphic purposes the resonator renders possible the sending of a great number of telegrams over one wire simultaneously, with the further advantage that "tapping" the wire can be made practically impossible. Communication can be maintained between a central station and each of a number of trains, thus minimising the danger of collision, and there are numerous other applications possible, which we cannot deal with here.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Sept. 12th, 1916	10,839	7	4
A. R. Weekes	0	10	0
Collected at the Westland Aircraft Works, Yeovil (Forty-eighth contribution) ..	1	2	4
Total, September 19th, 1916 ..	10,840	19	8

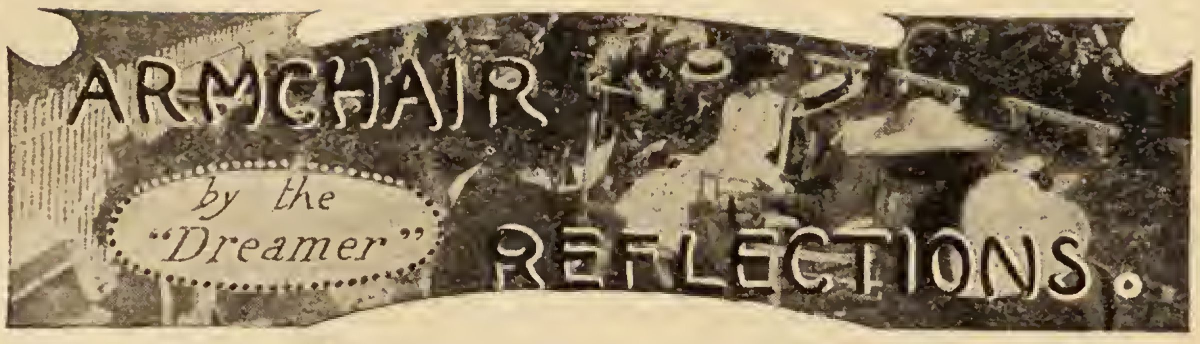
166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

Fatal Accidents.

At an inquest on September 13th relative to the fatal accident, on the previous day, to Captain Olive H. Ormrod, R.F.C., it was stated that the machine rose with one wing down, presumably through insufficient flying speed, and at a height of 40 ft. the machine side-slipped and made a nose-dive to the ground, Captain Ormrod's skull being fractured. A verdict of "Accidental Death" was returned.

An inquest was held at Aldershot on September 14th on Geoffrey L. Railton, a pilot at the R.A.F., and Frederick Williams, draughtsman, who were killed on September 12th. Something was seen to go wrong with the right wing, the machine spiralled and then corkscrewed to the ground. Evidence was given that the machine had flown 36 hours previously and was then all right. It was thought that the accident was due to the failure of a steel fitting supporting the outer end of the top right hand wing. There was a flaw which could not be detected from the outside. A verdict of "Accidental Death" was returned.

A verdict of "Accidental Death" was returned by a Birmingham jury at an inquest on September 18th on Flying Officer and Inspector John Hodges and Second Lieutenant Leslie Fyson. Evidence showed that the two officers went up in a biplane which was completely overhauled before the start. It was in a perfect condition for flying purposes. The machine was seen to "loop the loop" at a height of about 3,000 ft., and although it seemed to go through the evolutions all right at first, a movement of the tail plane was noticed. The machine then appeared to collapse and fell to the ground.



ARMCHAIR REFLECTIONS.

by the "Dreamer"

HAVE you ever heard the tale of the old iron pot? No. You mustn't say "No," and you mustn't say you "Don't know," and you mustn't say you "Don't remember." In fact, you mustn't say anything. It's simply the tale of the old iron pot, and there is no getting away from it.

Now, with regard to getting away from it, there is something that whacks the old iron pot into tiny fragments.

Are you in possession of any invention, or process or method of manufacture, or any article manufactured or proposed to be manufactured? If so, you are in a bad way, for you must to the authorities furnish drawings, models, plans, and explain and demonstrate the same to such person appointed, in all or any of its uses and workings. "And if any person fails or neglects to comply . . ." Well, may your Patron Saint help you.

Have you any document, note, photograph, sketch, plan, design, model, pattern, specimen, and all the rest of the words in the dictionary? Then you have piled up for yourself a lot of trouble.

For a solution to all this pother you should turn to a special supplement to the *London Gazette* which has been issued, containing additions to the regulations under the Defence of the Realm Act, where you will find it set out under Clauses (*a*), (*b*), (*c*), (*d*), and with an introduction as follows :—

"If any person having in his possession or under his control any document, note, photograph, sketch, plan, design, model, pattern, specimen or article (including any key or other article affording means of access to information) of such a nature as is calculated to be, or might be, directly or indirectly useful to the enemy . . ."

That sounds drastic enough, doesn't it? Almost terrible enough to make one think of destroying any incriminating evidence. But, steady! You must do none of that. Here is Clause (*a*), which follows the drastic introduction above :—". . . without lawful authority destroys, makes away with, or allows any person to inspect or to be in possession of such document, note, photograph, sketch, plan, design, model, pattern, specimen, or article as aforesaid; or . . ."

Oh, dear no! You can't get rid of it by the simple process of losing it like a yellow dog. You're up against Clause (*b*) then, which says :—". . . loses, fails to take reasonable care of, or so conducts himself as to endanger the safe custody of, such document, note, photograph, sketch" (and most of the other words in the dictionary) "or article as aforesaid; or . . ."

What, you will have to keep it then? Well, I'm afraid you will get into trouble if you do, because Clause (*c*) says :—". . . retains such document, note, photograph" (and all I have chronicled before), "or articles as aforesaid in his possession or control when he has no right to retain it, or when it is contrary to his duty to retain it; or . . ." And so to Clause (*d*) :—". . . fails to comply with any directions issued by lawful authority with regard to the custody, production, or the return of such document, note, photograph, sketch," and all the rest of it, and a bit more if possible, "or article as aforesaid; he shall be guilty of an offence against these regulations, and if any person without lawful authority or excuse, has in his possession or under his control any document, note," &c., &c., &c., and so forth and so on, "or article as aforesaid, he shall be guilty of an offence against these regulations."

Now you will thoroughly understand it, and see that if you have any documents, notes, photographs, sketches, &c., &c. (try another dictionary), in your possession, you'll have to turn them all out. There's going to be a sort of kit inspection on a magnificent scale.

You will notice it says :—". . . of such a nature as is calculated to be, or might be, directly or indirectly useful to the enemy."

That reaches a long way; a very long way. In fact, I am not quite sure how far it does reach. There are those old photographs, sketches, &c., &c., that you took on the east coast four years ago when on your holidays. What are you going to do about it? They certainly might be of use directly or indirectly to the enemy.

All those sketches, plans, drawings, blue-prints, designs, calculations, &c., &c., of the 'bus you are building, or going to build, or thinking of building, or might build. Out they will all have to come to the broad light of day. There is no bilking it.

The fiat hath gone forth in the quoted words as above, and there is going to be trouble in the camps, for nobody can tell for certain just what it embraces; as a fact, it appears on the surface to embrace everything, *Ab ovo usque ad mala*.

As I have said, this business is very far-reaching. From the cephalic region, reach tentacles penetrating into the utmost cavities of private and public life. Read this again :—". . . of such a nature as is calculated to be, or might be, directly or indirectly of use to the enemy." I do not suppose it is intended that it shall be so all-embracing as appears, but that it could be, the order of the phrasing leaves no shadow of a doubt.

Reading it *en bloc*, it would appear that the authorities are desirous of having the benefit of any invention emanating from the brain of the private individual; past experience points a rather steady finger to fact in that inventors and their inventions have received scant encouragement to lay the result of their working before those able to use all good things for the national welfare. As an ideal, it is, of course, ideal. It is right and patriotic that Government should have first call upon anything of use from the service point of view; but it appears to me that organisation necessary to the bringing of the idea into measurable distance of being smoothly workable is of such colossal proportions as to be seemingly impossible.

Who is to decide whether a thing is calculated to be directly or indirectly of use to the enemy? Those in authority, of course. This, governed by the clause making it an offence not to disclose all plans, sketches, photographs, &c., &c., means that the Department (a new one, I presume) will be simply inundated with inventors arriving in thousands to exhibit their brain-waves, good, bad and indifferent.

There must be hundreds of thousands of men in this country at the moment who have plans, drawings, designs, photographs, &c., in their possession, sufficient, if they lay them before the board, to keep the members of that judicial department going for the rest of their lives. For how is one to decide what is, and what is not, calculated by the official mind to be directly or indirectly of use to the enemy?

It is comparatively easy to make laws, but oftentimes vast machinery has got to be evolved in order that those laws shall be enforced. It is an offence for a man to break into another man's house and remove his goods and chattels. Yet it takes whole armies of policemen, judges, magistrates and what not, with vast organisations throughout the entire world, to enforce observance.

THE ROLL OF HONOUR.

The Secretary of the Admiralty announces the following casualties:—

Accidentally Injured.

Flight-Sub-Lieut. G. S. Gray, R.N.
Flight-Sub-Lieut. L. Edwards, R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Lieut. A. J. Bowerman, Somerset L.I., attd. R.F.C.
Second Lieut. G. N. Cousans, R. Innis. Fus., attd. R.F.C.
Second Lieut. A. E. Glen, R.F.C.
Lieut. H. S. Mackay, R.G.A. and R.F.C.
18049 2nd Air-Mechanic E. Emmett, R.F.C.

Died of Wounds.

Second Lieut. L. D. Russell, R.F.C.
10776 2nd Air-Mechanic C. C. D. Playle, R.F.C.
3538 1st Air Mechanic H. P. Warminger, R.F.C.

Died.

17530 2nd Air-Mechanic D. Menzies, R.F.C.

Wounded.

Lieut. E. Ambler, W. Yorks Regt., attd. R.F.C.
Second Lieut. W. H. C. Buntine, Sher. For. and R.F.C.
Second Lieut. C. J. Campbell, R.F.C.
Second Lieut. C. R. Cook, R.F.C.
Second Lieut. D. H. Dabbs, Yeomanry and R.F.C.
Lieut. E. D. Hicks, General List and R.F.C.
Second Lieut. F. H. Hodgson, R.F.C.
Second Lieut. F. D. Holder, Buffs (E. Kent) and R.F.C.
Second Lieut. H. A. Howell, R.F.C.
Capt. G. G. A. Williams, Dragoon Guards, attd. R.F.C.
8447 2nd Air-Mechanic J. E. Allan, R.G.A., attd. R.F.C.
25546 2nd Air-Mechanic E. R. Brotherton, R.F.C.
5708 2nd Air-Mechanic E. C. Skinner, R.F.C.

Previously unofficially reported Killed, now reported Wounded and Prisoner of War in German hands.

Second Lieut. C. J. Sandys-Thomas, R.F.C.

Previously reported Missing, now reported Wounded and Prisoners of War.

Second Lieut. S. H. Ellis, R.F.C.
Second Lieut. L. N. Graham, W. Yorks Regt., attd. R.F.C.

Previously reported Prisoner of War, now reported Wounded and Prisoner of War in German hands.

Lieut. W. O. T. Tudor-Hart, North'd Fus. and R.F.C.

Missing.

Lieut. E. G. A. Bowen, R.G.A., attd. R.F.C.
Lieut. E. Bainbridge, R.F.C.
Second Lieut. E. C. Kemp, Yorks Regt., attd. R.F.C.
Lieut. N. P. Manfield, Northampton Regt. and R.F.C.
Lieut. R. M. Stalker, Seaf. Highrs. and R.F.C.
Second Lieut. J. C. Taylor, K.O. Scot. Bord., attd. R.F.C.
Second Lieut. C. L. S. Thomas, Border Regt., attd. R.F.C.

Previously Unofficially, now Officially, reported Prisoner of War in German hands.

Capt. T. W. P. L. Chaloner, Yorks Regt. and R.F.C.

Previously reported Missing, now reported Prisoners of War in German Hands.

Lieut. M. R. Chidson, R.G.A., attd. R.F.C.
Second Lieut. C. D. Griffiths, R. Welsh Fus. and R.F.C.
Second Lieut. D. S. C. Macaskie, R.F.C.

Previously reported Missing, now reported Prisoner of War.

2458 Corpl. R. G. Johnstone, R.F.C.

Correction:

Previously reported Missing, now reported Prisoner of War.

Capt. J. H. F. McEwen, Cameronians (Scot. Rif.), attd. R.F.C., should read:
Capt. J. H. F. McEwen, Cameron Highrs., attd. R.F.C.

Echoes of the Jutland Battle.

In a supplement to the *London Gazette* published on September 15th were published despatches from Admiral Sir John Jellicoe, giving list of recommendations for honours, promotion, &c., in connection with the Battle of Jutland.

In the list of officers recommended by Vice-Admiral Sir David Beatty for honours is the following:—

Lieutenant Frederick Joseph Rutland, R.N. (Flight-Lieutenant, R.N.A.S.).

For his gallantry and persistence in flying within close range of four enemy light cruisers, in order to enable accurate information to be obtained and transmitted concerning them. Conditions at the time made low flying necessary.

The King has been graciously pleased to give orders for the award of the Distinguished Service Cross to the undermentioned officer in recognition of his services as mentioned in the foregoing despatch:—

Flight-Lieutenant F. J. Rutland, R.N. (Lieutenant, R.N.).

Among those recommended by Sir John Jellicoe for promotion from Lieutenant-Commander to Commander appears the following:—

Charles Gwillim Robinson.

In command of "Engadine." Was prompt in sending up a seaplane to scout. Handled his ship in a skilful and seamanlike manner, and towed "Warrior" for 75 miles, subsequently succeeding in taking off her crew, thus saving their lives.

Legion of Honour for R.N.A.S. Officer.

In the *London Gazette* of September 15th it was announced that the President of the French Republic has bestowed the decoration of the Legion of Honour, with the approval of His Majesty the King, on the undermentioned officer, in recognition of his services during the war:—

Lieutenant Lancelot Tomkinson, R.N. (Flight-Commander).

A Military Medal for the R.F.C.

In the long list of awards of the Military Medal notified in the *London Gazette* of September 14th:—

5800 Corporal (Acting Sergeant) J. H. Waller, R.F.C.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to " FLIGHT *" about it.*

J. J. M. (Byfleet).

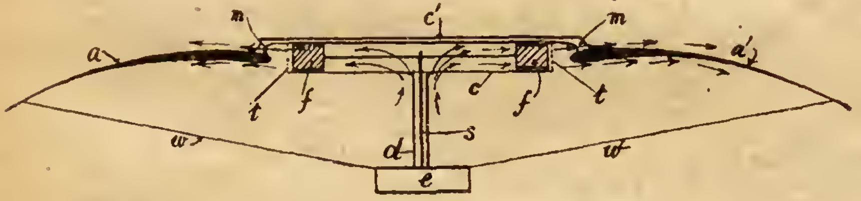
The lift (K_y) and drag (K_x) coefficients of the Kauffman section published on p. 604 of our issue of July 20th, are converted into "absolute" coefficients by division by ·0051. Thus, for instance, the lift coefficient at 10 degrees incidence is given as ·0026; ·0026 ÷ ·0051 = 0·51 approximately, which is therefore the absolute lift coefficient at 10 degrees incidence. You will have noticed that in the N.P.L. reports, in order to obtain the lift in lbs. square feet, it is necessary to multiply the absolute coefficients by ·0051V^2, where V = the speed of the machine in miles per hour. In our graph we had already multiplied the absolute coefficients by ·0051, so that in order to obtain from the graph the lift in lbs. per square foot it is only necessary to multiply the coefficients given by V^2, where V = the velocity in miles per hour.

R. M. H. (Erith).

By "warp control" is meant a twisting of part or the whole of an aeroplane wing, so as to increase the angle of incidence towards the tip, thereby increasing the lift. In most modern machines wing warping is no longer employed, as it tends to cause fatigue in the material of which the wing is constructed. *Ailerons* or balancing flaps hinged to the outer portion of the rear spars are used instead. The effect of an *aileron* is to increase the camber of that portion of the wing. The reason for gearing down a propeller is that a slow-running propeller of large diameter is more efficient than a fast-running one of smaller diameter. or, in other words, generally speaking, less power is required to impart a small velocity to a large mass of air than to give a high velocity to a small mass of air. The difference between propeller and tractor air screws was explained in our column on p. 717 of our issue of August 24th. The vertical attitude of a Zepp. when climbing is more apparent than real. These airships do, of course, point their nose upwards when climbing rapidly, in order to obtain lift from their screws, but we doubt very much whether they ever approach the vertical. What causes them to appear vertical is probably the perspective in certain attitudes combined with the climbing angle.

"AEROSTAT" (West Kensington) writes:—

"In view of the development of large goods-carrying aeroplanes or airships without aerostats, and of the disadvantages of dirigibles for such work, the opinion of any correspondents as to the practical nature of the idea would be very welcome.

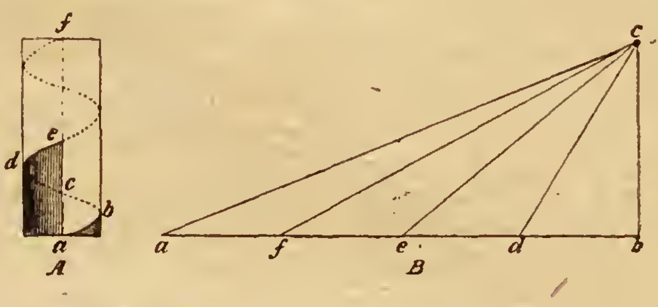


In the sketch, which shows merely a general scheme, a centrifugal fan, *f*, rotates in a cage, *c*, of which the top is closed by a disc, *c′*, supported by struts, *t*, and having arms, *m*. These arms support an annular cambered plane, *aa′*, arranged as an inverted saucer surrounding the fan. An engine platform, *e*, carries a shaft casing, *d*, which encloses the fan-driving shaft *s*. Tension wires, *w*, are provided. Air currents are drawn in beneath the fan cages, and are directed by the fan (as shown by the arrows) against the annular plane. The plane is thus acted on by a relative wind precisely as is the wing of an ordinary aeroplane, and both top and bottom surfaces contribute to the 'lift.' An airship without wings, but having such a lifting plane at bow and stern, and with a propeller to supply lateral motion, would certainly resemble the airship of fiction."

We doubt very much whether such an arrangement as you suggest would meet with any success. To drive a centrifugal fan which would deal with the necessary amount of air and impart to it sufficient velocity to impart any lift to the annular cambered plane, would probably require a good deal more power than that necessary in the ordinary direct lift machine. Also some vertical surface would have to be provided to counteract the torque of the fan, as otherwise the whole machine would spin round its vertical axis.

F. W. (Monmouthshire).

Perhaps the easiest way to understand the principle of a true screw is to imagine an inclined plane wrapped around a cylinder, as shown in A, where the shaded portion represents the inclined plane, making one complete turn round the cylinder. The inclined edge of the plane forms the helix *abcde*. If the inclined plane were laid out flat as shown in B, the base line *ab* would represent the circumference of the cylinder, and the perpendicular line *bc* would represent the pitch of the helix. The line *ab* may therefore be taken as the circumference of the circle described by a point at the tip of the blades, while *bc* is the distance advanced along the axis in one revolution. The angle *cab* is the helix angle at the tip. If *bd*, *be* and *bf* are set off from *b* along *ab* so that they represent the circumferences of circles described by points situated one-fourth, one-half and three-fourths of the length of the propeller blade, and are joined up to the point *c*, the resulting angles will be the helix angles at these points. It is usual practice to increase the chord angles of the propeller blade at the various points by from 2 to 5 degrees, these angles being termed the angles of attack, and corresponding to the angle of incidence of an aeroplane wing. It will thus be seen that if the chord lines be produced they will not meet the vertical line in the point *c*, but at a point higher up, how much higher will depend on the magnitude of the angles of attack. It should be pointed out that the chord angles need not always be greater than the helix angles, but this is a point on which we cannot touch here.



To take a numerical example: Let us suppose that we wish to design a propeller for a machine to fly at 72 m.p.h., or 100 ft./sec. The maximum permissible diameter we shall take as 8 ft.—the diameter is usually decided by constructional considerations, such as keeping down the height of the undercarriage. The propeller is to run at 1,200 r.p.m., or 20 r.p.sec. The pitch is therefore 100 ÷ 20 = 5 ft. The circumference of the circle described by a point at the tip of the blade is = π × diam. = 3·1416 × 8 = 25·13 ft. We therefore mark off the base line to some suitable scale to represent a length of 25·13 ft., and mark off the vertical or pitch line to represent 5 ft. We can now mark off any points desired at any desired distance from the foot of the vertical line, and by connecting these points to the top of the vertical line the corresponding helix angles are found.

* * *

Another Famous German Pilot Killed.

THE *Vossische Zeitung* reports that Lieut. Fahlbusch, who was mentioned in the Berlin *communiqué* of September 4th as having "greatly distinguished himself in recent successes," has been killed in action.

The Bill Raid on Brussels.

CONSIDERABLE enthusiasm appears to have been aroused among the Belgian population of Brussels by the appearance of an Allied aeroplane distributing parcels of bills last week. Although it was heavily bombarded, the machine got away safely after dropping some bombs on the Zeppelin sheds and severely damaging them. By way of venting their chagrin the Germans accused the inhabitants of making light signals to the airman, and as a punishment ordered that everyone must be indoors before 7 p.m.

Instruction in Petrol Motors, &c.

EVENING classes for instruction in the care and repair of petrol motors commence at the Borough Polytechnic, Borough Road, S.E., on September 25th, and those who wish to take advantage of the course should enrol at once. Apart from the lectures on Mondays, there is practical work on Wednesday and Thursday evenings as well as classes for drawing and calculations. The fee for the course is 30*s.*; and the instructors are Mr. A. Marsden, M.I.A.E., A.M.I.M.E., and Mr. W. Hill, A.M.I.A.E. There is also a course in motor car engineering, which commences on September 27th.

FROM THE BRITISH FLYING GROUNDS

Grahame-White School, Hendon.

Straights with instructors last week: Messrs. Kaizer, Lord, Green, Payne, Rogers, Steeves, Sutherland and Travers. Circuits with instructors last week: Messrs. Culver, Edwards, Hodgkinson, Meering, Saunders, Styles and Zambournis.

Brevets during week: Messrs. Lyles and Mills.

Instructors: Messrs. Manton, Winter, Pashley and Biard.

Hall School, Hendon.

Pupils out last week:—With Cecil M. Hill: Lieut. Malden, Messrs. Cowell, Dutton and Rand (extra practice). With Fred J. Glegg: Messrs. Smith, Henley, Barton, Mayer, Bateman and Lieut. Packman. With Gerald Smith: Messrs. D. A. Stamps and L. F. Barton. With Stanley G. Cownie: Messrs. Blake, Pugh, Foster, Course, Heathcote and Yuill.

Royal Aero Club certificate taken by Mr. D. A. Stamps in excellent style.

Hall (Government-type) tractors in use.

London and Provincial School, Hendon.

Royal Aero Club certificates were taken this week by Messrs. W. R. Jones and G. A. Quayle.

Instructors: Messrs. W. T. Warren, M. G. Smiles, P. G. Allen and W. T. Warren, Jun.

Five machines in use.

Bournemouth School.

Pupils rolling alone last week: Messrs. Ross, Burry and Allen. Doing straights alone: Messrs. Brandon, Montgomery, Holland, Davies and J. B. Smith. Half circuits alone: Messrs. Constant and Montgomery. Eights and circuits alone: Messrs. R. G. Hammersley, R. P. Fenn, H. Smith, W. A. Pritt, J. Adamson, C. S. Hinchliff and W. H. Wilmot.

Instructors: Messrs. S. Summerfield and E. Brynildsen.

Certificates were taken during the week by Messrs. R. G. Hammersley, R. P. Fenn, H. Smith, W. A Pritt, J. Adamson, C. S. Hinchliff and W. H. Wilmot.

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FLYING AT HENDON.

There was a much better attendance at Hendon Aerodrome last Saturday afternoon, and plenty of flying was to be seen. Messrs. Marcus D. Manton, J. S. B. Winter, C. Pashley, B. F. Hale and H. C. Biard were busy all the afternoon taking up passengers on the 80 h.p. Grahame-White three-seater biplane. Pashley on one occasion ascended with two khaki passengers to an altitude of about 600 or 700 ft., from which he descended with a series of graceful right- and left-hand spirals. Manton also put up a very fine show on a de Havilland pusher scout, which must have been a change, indeed, after coming fresh from a "box-kite." We had a very welcome aerial visitor in Flight-Lieut. F. Warren Merriam, who came over from Chingford with a pupil passenger on a Grahame-White biplane. His descent into the aerodrome was quite spectacular, for, cutting off his engine at a great height, he "floated" down very slowly, at times hovering almost motionless and then swooping in wide spirals. M. G. Smiles put up some more looping on the L. and P. tractor. He also flew over to Golders Green and gave a fine demonstration above a "Charity Show." The writer had the pleasure of accompanying Smiles on this trip as passenger, and it must be admitted that, inspiring at it is, the looping of the machine when viewed from the ground is nothing compared to the "looping" of the ground when viewed from the machine. Starting off at about 4.30, we circled around until well up above the appointed spot—the circular, white marquees, and ant-like merrymakers being plainly visible. After an overture of banked turns, "eights," &c., we began a series of 14 consecutive loops, the little white marquees appearing over the top plane during each loop with the regularity of clockwork, but getting bigger and bigger each time. At the top of the fourteenth loop the engine, which had been going all out the whole time, faltered somewhat, so it was given a chance to get its breath back again before further loops were attempted. A few more loops brought us within a few hundred feet of the ground, so we made tracks for the 'drome, Smiles giving one final, joyful loop, as we entered it. Other machines out during the afternoon were several B.E. 2—some-letters-of-the-alphabet—Curtiss tractors, a Maurice Farman—which did vertical banks—a Sopwith 1½-strutter, and a Dyott battleplane. In the evening the various schools got going.

Sunday's proceedings consisted solely of passenger work on the Grahame-White 'bus, rain in the evening putting a stop to further work.

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Lord Montagu at Edinburgh.

Lord Montagu, in connection with the series of meetings arranged by the Navy League, visited Edinburgh on September 12th and addressed a gathering of business men in the Freemasons' Hall, his subject being "Aircraft Policy."

Speaking of aircraft used for military purposes, Lord Montagu remarked that he did not wish to go back to the somewhat heated and rather exaggerated controversy of six months ago. He preferred to look to the future.

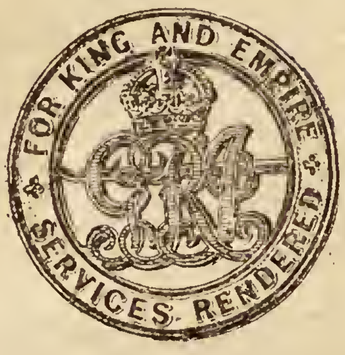
As to what would happen after the war, Lord Montagu remarked that in his opinion peace was somewhat afar off yet—probably a year, probably more. In any reduction we might have to make from the pressure of finance, the aircraft service must be the last to be affected. Since aircraft had become so large and numerous, we were no longer an island. We were liable to invasion. In future, invasion would not be by a score or two of airships and a hundred or two of aeroplanes, but on an infinitely larger scale. We would require to have aircraft all round the coast. At least 1,000 miles of our 2,000 miles of coast would have to be defended. These places of defence could not be more than 20 miles apart. There were frontiers all over the world to defend. There was a frontier of 1,200 miles on the north-west of India. It could be defended at less cost and with greater certainty in this way than in any other. Aircraft must more and more become the weapon of the nations of Europe, if only because it was the weapon of poverty. You would get more result out of £1,000 spent on aircraft than from any other form. Suppose we had a permanent force in this country of 20,000 aeroplanes. That should not cost more than 15 millions to start with, reckoning at £750 apiece. You would not need more than two officers apiece to work them, and, say, 120,000 other *personnel*, making about 160,000. Could we say these were beyond what seemed to be the necessities of the case? It was the minimum which we must consider.

A Fokker in East London.

The most popular of the "side shows" at the National Economy Exhibition which opened at the People's Palace, Mile End Road, on Monday, is the tent housing a Fokker monoplane and some of the guns recently captured on the Western front. The Fokker is similar to that described, with scale drawings, in "*Flight*" of December 10th, 1915, except that it has a 9-cyl. 100 h.p. German-Gnome engine instead of a 7-cyl. 80 h.p. one.

AIRISMS FROM THE FOUR WINDS.

Design of the silver badge to be worn by men who



have returned from the front to *mufti* once more.

A recent contribution to the Lord Kitchener Memorial Fund is £36 15*s.* 10*d.* from the Anti-Aircraft Training Depôt, per Lieut.-Col. R. P. Leach.

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The "sporting instinct" of the Boche was well illustrated on the occasion of the recent raid on Ghent. The German soldiers rushed out of the arsenal, closing the gate behind them and preventing Belgian workmen from getting out, so that the latter had to jump through the windows.

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H.M. the King was very interested in the work of the R.F.C. during his visit to Oxford on September 13th.

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The aeroplane proved very useful to the British Consul at Kavalla in superintending the evacuation of the civil population. He made several trips by way of the air to the Island of Thasos to arrange details.

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The monoplane piloted by Lieut. Warneford when he strafed the Zepp. is now the most popular item in the Red Cross Active Service Exhibition at Liverpool.

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Burton-on-Trent is likely to be famous for other things besides ale.

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One of its claims is that it is the centre of England. There are those who have the idea of making it the centre of the British aircraft industry.

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Testing tractors on the Trent. Sounds attractive, doesn't it?

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No doubt Ernest Ridgewell, who was fined £3 at Brentwood, Essex, for not immediately extinguishing a light when ordered to, on the night of the air raid, wishes he had not told the special constable that he must wait.

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With the enormous extensions of the shops in aircraft factories, it frequently becomes a matter of some difficulty to quickly locate any particular man wanted quickly. Mr. Sigrist, works manager of the Sopwith Aviation Co., has thought out a very neat scheme whereby any shop foreman, manager, or other head of a department may be instantly summoned from any part of the extensive works where he may happen to be at the moment. Suspended from the ceiling in a central and conspicuous position are a series of electric bulbs of different colours, each head of a department having his own colour. Each of the bulbs is connected up to a switchboard conveniently placed, and if, for instance, Mr. Sigrist is wanted, a blue light is switched on. If by any chance he himself does not happen to see the light at once, someone is sure to do so and report that the particular light is on.

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There can be no question of the efficacy of this system, which we had an opportunity of testing recently. Although in the execution of his duties as works manager, Mr. Sigrist is literally "all over the shop," it only took us a matter of a minute or so to find him.

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Result, a lot of time and temper is saved. Other firms please copy.

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Although serving very well in its time, the little office in which the secretary of the Wells Aviation Co. laid the foundation for the important organisation since built up is no longer sufficient or in keeping with the size of the firm. Quick to realise this, as other demands of the times, there has now been established large and excellently appointed offices with a main entrance in Whitehead's Grove, adjoining the works, or some of them at any rate, for it is now almost impossible to walk through one of the streets in this part of town without coming across a shop in which Wells workmen are hard at it.

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The premises for the new offices are two large three-storey houses knocked into one, and arranged in modern fashion with general offices, private offices, drawing offices, filing rooms, &c. Everywhere the furnishing and decorations are in excellent taste, simple and restful to the eyes. The hand of the artist is noticeable throughout. This is hardly, of course, surprising when it is remembered that both Mr. Wells and his indefatigable secretary, Mr. Doyle Jones, were sculptors of no mean ability before turning their attention to aeroplane construction.

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We hope that the old laurel wreath with the inscription, "In loving memory of the Col'drum Pottery," will be transferred to the new premises, where it would recall for all time the old shop in which the foundation of the present successful factory was laid.

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Flying lifeboats are now in use at Atlantic City, and one has already effected a rescue. A bather drifted a quarter of a mile out to sea on an inflated tyre. The captain of the beach control sighted him, and started off in Beryl Kendrick's flying boat. The bather was soon picked up and brought ashore, where he received medical attention. Two flying boats, owned respectively by Kenneth Jacquith and Kendrick, are now as a result officially a part of the life-saving equipment of this district.

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What is the joke about the black flag hoisted on the judge's box at Hendon?

"One of Ours," who is hard at it at the Front.—Mr. Roderic Hill, whose delightful pictures are familiar to readers of "FLIGHT," and who philosophically writes that he "supposes 'Archie' is one of the world's necessary evils."

SOME of the pupils there say they can't see it!

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AND how about colour-blindness?

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LORD MONTAGU of Beaulieu is shortly passing temporarily out of the "realms of the air," so far as the advocacy of its future is concerned. He is likely in the next few weeks to return to India to carry out duties there. In all probability he will not, however, be unassociated with airism. We wish him good health and success in the King's service, and we shall look to his re-opening—if it be then still necessary—his campaign for the vast expansion of the air services to one of Imperial magnitude.

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"HUNZOLLERN" is a very happily coined designation, hailing from America, of the Prussian barbarian.

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MR. HANDLEY PAGE is to be reckoned amongst the earliest subjugators of the air. He has always been original and well ahead in most things that matter in aviation up-to-dateness. Therefore we gladly give space to his forethought in having long since erected and had running a wind tunnel, by means of which a good deal of research work has been carried out. In fact, as he very modestly puts it, in reference to an airism last week giving the initiative in this respect to the Curtiss Co.: "I think that we can safely challenge other private firms as to priority in this respect."

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MODESTY is ever an asset to be encouraged in these days of "push." No thought of self enters the mind of our Service pilots when on the track of the Hun. Just strafing him for the public weal is the only thing that matters with one and every one of them. Therefore it is in refreshing contrast to all the lavish columns of almost nauseating praise which has been spread over the successful Zepp. attack of Flight-Lieut. Robinson to record the strafer's own views upon the incident. Thus spoke Lieut. Robinson, V.C., on Thursday last at the Baltic, when he formally "lifted" one of the little cheques which were waiting for the first pilot to bag a Zepp. over British soil:—

"The thing that I had the good fortune to do, of bringing down a Zeppelin, is a thing which anybody in the Corps, you all know perfectly well, would have done exactly the same if they had the same good fortune that I had.

"I was not the only one to go up after that Zeppelin. You must know that in the case of every Zeppelin that has been over England or near England there have been many airmen who have gone up, and in far worse conditions than I had, I think, that night—men who have gone up in conditions that meant almost certain death.

"Many of them have met their death in chasing these inhuman murderers who have come over here.

"Men, friends of mine, have been maimed for life by going up just on the off-chance of 'strafing' them on absolutely impossible nights, nights when it has been exceedingly difficult to land, misty nights, nights when you can't see the ground—you get up into the mists and can see nothing of earth. All these deeds I consider a hundred times more heroic than the thing I did.

"It was, I must impress upon you all, merely good fortune on my part. I feel a lot of honour and glory have already been given me, and I feel almost, I would not say criminal; I can't quite express my feelings on the subject, but I know I don't deserve all this kindness—all that you dear people have shown me.

"I just want to thank you, and am sorry English is such a poor language. If I could express myself as I could wish I should say a good bit more, but I simply cannot."

THAT'S the sort of spirit in which to look at these episodes in the world's war.

TEN YEARS AGO.

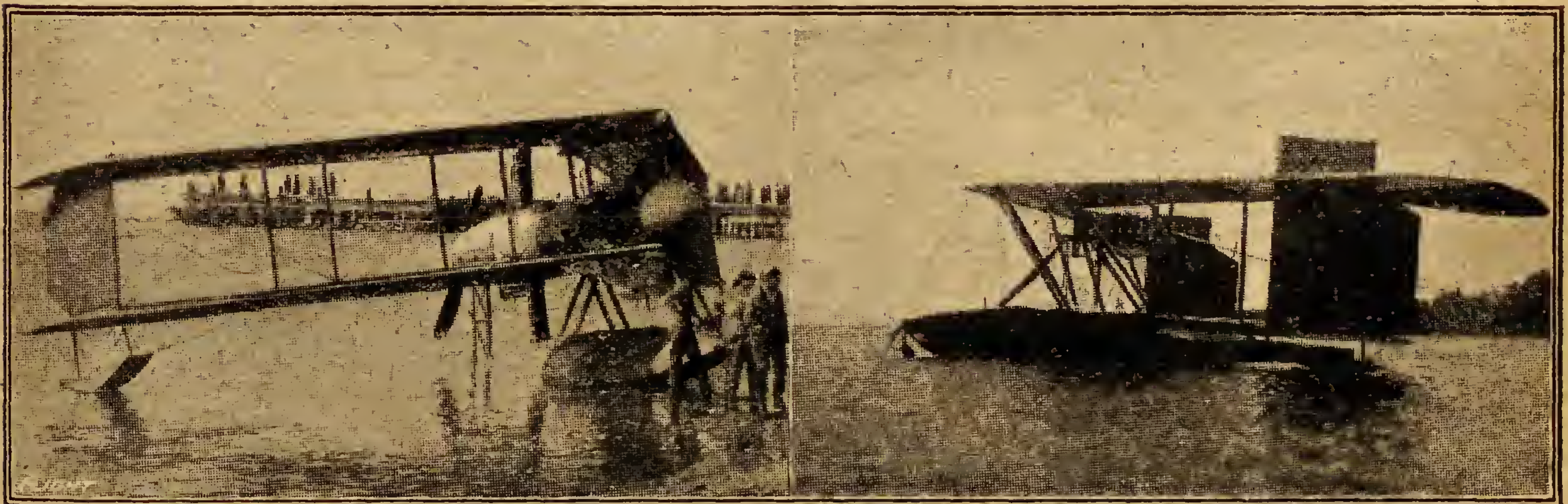
Excerpts from the "Auto." ("FLIGHT'S" precursor and sister Journal) of September 15th, 1906. "FLIGHT" was founded in 1908.

THE SANTOS DUMONT AEROPLANE.

M. Santos Dumont continues to prosecute his experiments in the park at Neuilly. The power of the motor applied to the machine has, as our readers are aware, been increased to 50 h.p., and on the evening of the 4th the aeroplane actually rose a few feet off the ground and executed, it is understood, a satisfactory free flight, estimated roughly at about 100 metres in distance, before again touching the ground. Great enthusiasm prevailed amongst the spectators, which was not to be wondered at, and M. Santos Dumont himself is quite naturally delighted and not a little surprised. The conquest was not a permanent one unfortunately, for on the following Friday he failed to effect free flight, though making several attempts; but this is not to be regarded as any very serious set-back, as the machine was just rising into the air, the two front wheels being well off the ground and the rear wheel on the point of rising, when M. Santos Dumont made a mistake and cut off the ignition by pressing the wrong lever, thus stopping the motor and bringing the machine to rest. Going out again on the 8th inst., M. Santos Dumont was just recommencing another series of experiments when unfortunately the cone of the propeller-shaft of the aeroplane broke, an accident which, of course, put an end to the proceedings for that day. The machine was taken back to the shed to be repaired and to have adjustments made to the carburettor, which, it is hoped, will have the effect of enabling the motor to develop the full power of its eight cylinders, which it apparently has not hitherto effectively done.

FOR THE GORDON-BENNETT CUP.

The shed in which the aeroplane is housed also contains the car for M. Santos Dumont's balloon "The Two Americas," with which he is going to compete for the Gordon-Bennett Cup. The car is provided with two lifting propellers and a De Dion motor to enable it to rise in the air and so increase the time it will remain afloat independently of the use of ballast.



By the courtesy of "Aerial Age."

DEVELOPMENT OF THE BURGESS-DUNNE BIPLANE IN AMERICA.—On the left a seaplane (140 h.p. Sturtevant) built for the U.S. Navy. Note the well streamlined *nacelle* and attachment of the pontoon. On the right is a flying boat, known as the Burgess-Curtiss type, which is the latest development of the Dunne system.

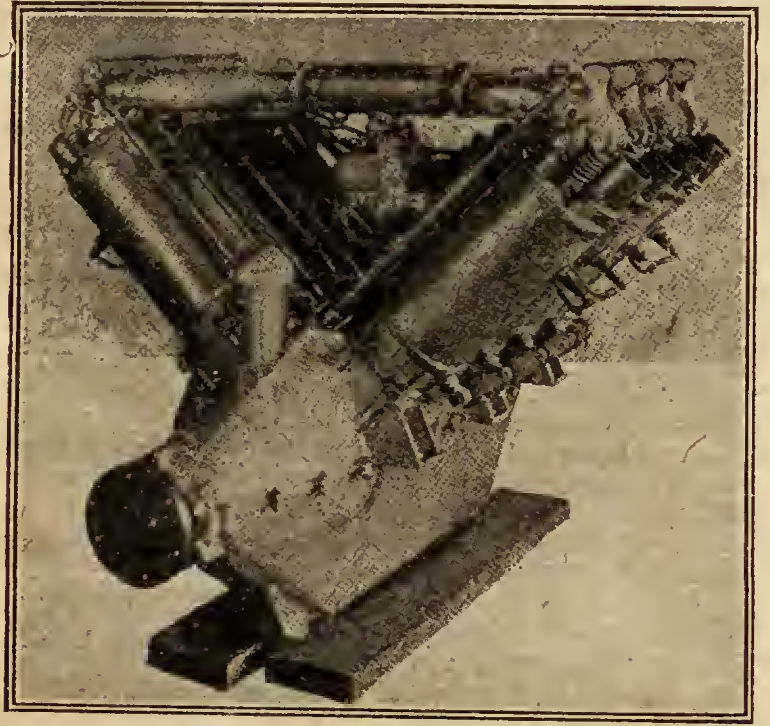
SOME AMERICAN AERO ENGINES.

THE 125 H.P. ORLO, MODEL 0–8.

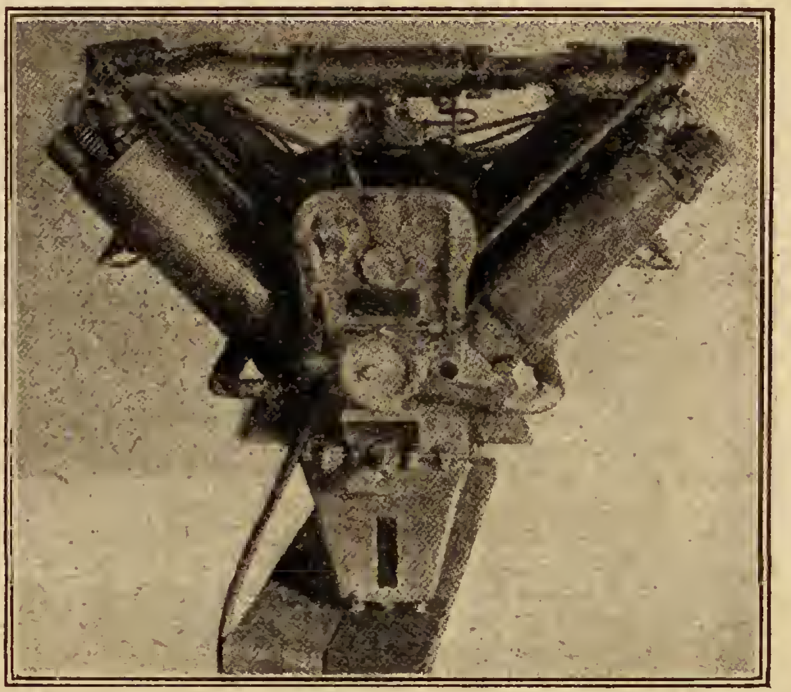
The Orlo model 0–8 aeromotor, which is manufactured by the Orlo Motor Co., of Rochester, N.Y., is of the 8-cylinder Vee water-cooled type, developing 125 h.p. at 1,400 r.p.m. The cylinders, which have a bore and stroke of 4½ and 6 ins. respectively, are cast separately. They are machined both inside and out to ensure uniform thickness and even expansion and contraction; the water jackets are of spun brass zinc-plated. Instead of bolting the cylinders down on to the crankcase, they are held down by steel studs which pass through the crankcase to the crankshaft main bearings, to which they are secured. Practically all the strain is thus taken off the crankcase, and the chance of a cylinder blowing off is likewise reduced.

All water and gas connections are so arranged that any one of the cylinders can be removed without disturbing the others. The valves are nickel steel, drop forged, and are located in the cylinder heads. Valve cages are not employed, with the result that leakage due to unequal expansion is eliminated, in addition to which is the simplification in design. Inlet and exhaust valves are each operated by a separate rocker arm and push rod from the single camshaft, which is placed in the crankcase between the two rows of cylinders. The valves are thus capable of accurate timing. The valve tappets are hardened and ground, and the guides are aluminium with phosphor-bronze bushes. Zinc-plated tubular steel is used for the push rods, which have ball and socket joints top and bottom.

The pistons are of grey iron, with phosphor-bronze bearings for the gudgeon pins. Chrome-nickel steel is used for the connecting-rods, which are tubular in section and 12$\frac{5}{16}$ ins. long. As the cylinders are placed directly opposite each other, one connecting-rod big-end bears directly on the crank pin, whilst the other embraces the first big-end. The crankshaft is hand-forged from chrome-nickel steel, machined and ground to size, and carefully balanced. Five babbitt bearings support the shaft, and a ball race takes the propeller thrust in either direction. The propeller flange is forged integral with the shaft, having hardened bushings inserted half in the flange of the shaft and half in that on the propeller. This arrangement relieves the propeller bolts from all shear, besides making a very strong coupling. The cams are keyed on to a hollow shaft supported by five phosphor-bronze bearings. The crankcase, of aluminium alloy, is well ribbed for strength, and is horizontally divided along the axis of the crankshaft.



View of the propeller end of the Orlo Aeromotor, Model 0-8.



End view of the Orlo Aeromotor, Model 0-8, showing the magneto and water circulating pump.

Lubrication is effected by means of a force pump, which draws oil from the lower half of the crank case—which has a capacity of 3½ gallons—and forces it to the hollow camshaft, whence it goes to the main bearings. It then passes through the crankshaft into the big-end bearings. Four nozzles on the camshaft squirt a stream of oil on to the connecting-rods, cylinder walls and gudgeon pins. Ignition is by two Dixie –80 magnetos, driven off the camshaft, which supply current for the two sparking plugs on each cylinder. The carburettor is mounted between the two rows of cylinders. An arrangement for raising the exhaust valves is provided to facilitate starting. The weight of the engine, complete with magnetos, carburettors, but without radiator or propeller, is given as 475 lbs., and the average fuel consumption is quoted as 12 gallons of petrol and 2 pints of oil per hour.

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Super-Zepps. not Up to Expectations.

If any reliance is to be based upon what the Berne correspondent of the *Agenzia delle Notizie* learns from a competent German source, the new super-Zeppelins have by no means realised the great expectations based on them. It is stated that they have proved distinctly unwieldy and very difficult to manœuvre, and it is generally believed that the previous type of Zeppelin, which though smaller was far more reliable, will in future be reverted to. A similar story was reported *via* Amsterdam some months ago.

PERSONALS.

Casualties.

Second Lieutenant ARTHUR JAMES BOWERMAN, Somerset Light Infantry and R.F.C., reported killed, was the only child of Mr. and Mrs. F. R. Bowerman, Grangemount, Wellington, Somerset. He was educated at Queen's College, Taunton, and afterwards became a member of the staff of Sedgwick, Collins and Co., insurance brokers, at Lloyd's. Early in September, 1914, he joined the Artists' Rifles, receiving his commission in the Somerset Light Infantry in the following December, and went to the Front in September, 1915. In January of this year he was attached to the Brigade Staff as grenadier and Intelligence Officer. At the end of July he was attached to the Royal Flying Corps, and graded as a qualified Observer. Lieutenant Bowerman was 20 years of age.

Second Lieutenant GUY N. COUSANS, Royal Inniskilling Fusiliers, attached R.F.C., whose death is announced, was born in 1897. He was educated at The Wick and Uppingham, and entered Sandhurst in April, 1915. He was gazetted into the Royal Inniskilling Fusiliers and was attached to the Royal Flying Corps in February, 1916. He was sent to the front in May last as Observer. He met his death in aerial combat on September 9th. He was the only son of the late Henry Edward Cousans, and stepson of Mr. Cousans, of Kimbolton House, Huntingdon.

Lieutenant HAMISH STRATHY MACKAY, Royal Garrison Artillery and R.F.C., who is reported killed, was 22 years of age, and was the younger son of Colonel J. F. Mackay, Whitehouse, Cramond, Midlothian.

Second Lieutenant JAMES LESLIE ROBERTON, Yorkshire Regiment and R.F.C., reported killed on September 6th, aged 21, was the youngest son of Mr. R. H. Roberton, J.P., and Mrs. Roberton, of Stoke Golding Lodge, near Hinckley, Leicestershire. He was educated at Magdalen College School, Oxford, and from there went to study farming at the Rhodesian Government experimental farm. On his return to England in 1914, having matriculated at the University of London, he entered the London Hospital as a medical student. In 1915 he joined the O.T.C., and received his commission in the Yorkshire Regiment. After being machine gun instructor for some time he was transferred to the Royal Flying Corps this year, and gained his pilot's certificate last month. When patrolling the lines he crossed to attack a hostile machine, and while doing so his machine was shot down by a Fokker.

Flight-Lieutenant CHARLES W. GRAHAM, R.N.A.S., aged 23, who was killed in a seaplane accident off the East Coast, was the son of Mr. C. K. Graham, 9, Kitson Road, Barnes, and was awarded the Distinguished Service Order early this year for gallantry while fighting in the air. He attacked and brought down a German seaplane, which caught fire and sank off the Belgian coast. He dropped into the water and swam ashore, having been previously wounded while trying a new machine.

Wounded.

News has been received by Mr. T. Garrood, of Friary Street, Guildford, that his son, Lieutenant G. GARROOD, R.F.C., is in hospital in East Africa, suffering from wounds. Lieutenant Garrood joined the Army in 1914, and was given a commission in the Inniskillings in 1915. In May last year he went to Gallipoli, and was so severely wounded that he was thought to be dead, and placed amongst those ready for burial, his father being officially informed that he had been killed. After a long period in hospital he returned to England, and qualified as a flying officer.

Married and to be Married.

A marriage has been arranged between THOMAS RICHARD CHETWYND, Lieutenant, 7th Dragoon Guards, attached R.F.C., eldest son of Mr. and the Hon. Mrs. Birkin, of Park House, Mapperley, Nottingham, and grandson of Sir Thomas Birkin, Bart., of Ruddington, and MARGERY TUSTIN, second daughter of the late Mr. W. J. Tustin and Mrs. Fielding-Ould, of 13, William Street, Knightsbridge, and granddaughter of the late Mr. J. Tustin, of Burstow Hall, Horley, Surrey.

An engagement is announced between Captain A. R. STANLEY CLARKE, Dorsetshire Regiment, attached R.F.C., only son of Mr. and Mrs. Stanley Clarke, of Berghmote, Wimborne, and MARJORIE, elder daughter of Mr. and Mrs. HIATT BAKER, of Oaklands, Almondsbury.

The engagement is announced of Lieutenant T. V. HUGHES, attached R.N.A.S., son of Mr. George Hughes, J.P., of Abbey Hill, Kirn, Argyleshire, and MABEL, elder daughter of Lieutenant-Colonel H. CURTIES, Rifle Brigade, of Hove, Sussex.

The engagement is announced of Flight Sub-Lieutenant H. V. TERRY, R.N., only son of Mr. and Mrs. A. Terry, of Highgate, and DOROTHY LYTTON, younger daughter of the late Mr. CHARLES WILSON, and Mrs. WILSON, of Highgate.

An engagement is announced between Flight Sub-Lieutenant NORMAN E. WOODS, R.N.A.S., younger son of Mr. William E. Woods, of Rangiora, Arthur Road, Wimbledon Park, and Sydney, and FLORENCE INNES, youngest daughter of H. I. PERKINS, I.S.O., F.R.G.S., F.G.S., Surveyor-General, B. Honduras, and Mrs. PERKINS, of Wimbledon Park, and granddaughter of Major-General Ed. Norman Perkins, Bengal Staff Corps.

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The Raid on Sofia.

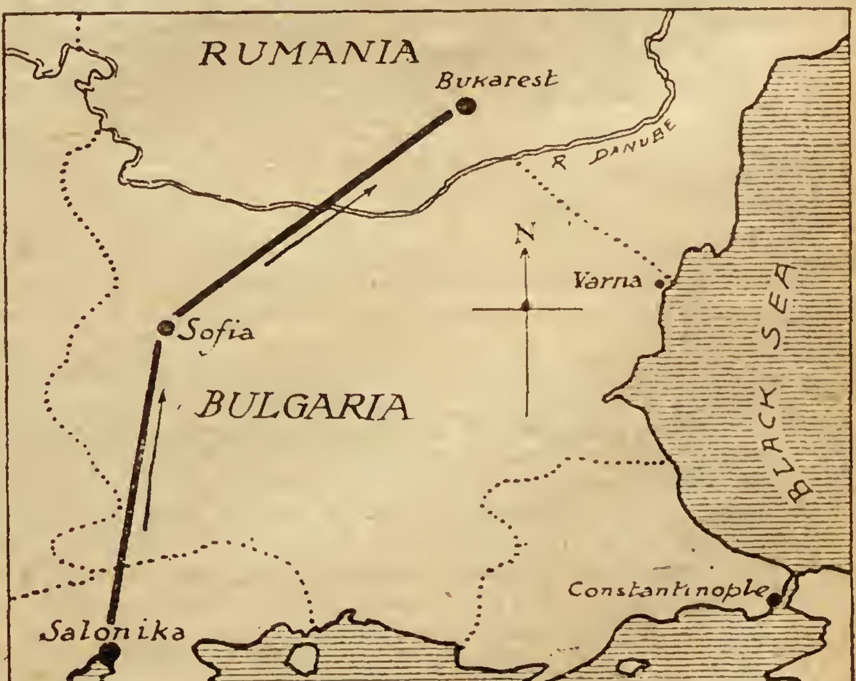
CARRYING a message from General Sarrail to the French Minister at Bucharest, Sub-Lieut. Noel—so well known at Hendon—and Lieut. Leseur on September 14th flew from Salonica to Bucharest, a distance of 350 miles, after dropping several bombs and a parcel of proclamations on Sofia. Two other French machines also started from Salonica with a similar mission, and landed in Roumania safely. Details, as given by one of those which reached Bucharest, are as follows:—

"Four machines left Salonica at 20 minutes past six in the morning on a military mission, and with orders to drop bombs on Sofia as a reprisal for the recent bombing of Bucharest.

"We arrived over Sofia at 20 minutes to 10 without having met with any adventures on the way. The gilded dome of the Royal Palace glittered in the brilliant sunshine, and served as a splendid mark. Several fires broke out. We were heavily shelled without being hit. A German aeroplane also attempted to attack us, but met with no success. At 20 minutes past 11 the first aeroplane arrived at the Bucharest aerodrome. The second reached the same place at 3 o'clock, while the two others landed in Roumanian territory."

A translation of the proclamation which was dropped is as follows:—

"People of Sofia! The soldiers of the Entente do not fight against the civil population. Our airmen bomb only military establishments. Zeppelins and German aeroplanes throw bombs on Salonica and Bucharest, assassinating old men, women and children. The Germans alone are capable of such deeds. Such crimes call for vengeance. People of Sofia! Your town to-day expiates the crimes of your allies. If such crimes are again committed, they will be followed by the same punishment."



A sketch-map of Noel's Sofia strafing flight.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), September 12th, 10.7 p.m.

"In the course of aerial fighting yesterday one of our machines, which returned safely, collided with a hostile aeroplane, which fell out of control and disappeared in the clouds. To-day a hostile machine was brought down in flames in our lines near Pozières. Two of our aeroplanes failed to return."

General Headquarters, September 14th, 10 p.m.

"Considerable aerial fighting this morning, two hostile machines being brought down in flames and one other driven to the ground. One of our aeroplanes is missing."

War Office, September 14th.

"*Tigris Line.*—On the morning of the 11th inst. the enemy's aerodrome was raided by our airmen, who destroyed a small camp."

General Headquarters, September 15th, 10.14 p.m.

"Our air service to-day has kept up constant and successful co-operation with our artillery and infantry, and frequent and accurate reports have been furnished of the course of the battle. Hostile artillery and infantry have been effectively gauged (?) by our aeroplanes with machine-gun fire.

"Many bombing attacks have been carried out against hostile aerodromes and railway sations, in the course of which troop trains were hit and transport railway siding attacked with machine-gun fire. Another German kite balloon has been brought down. The total number of hostile aeroplanes destroyed to-day is 13. Nine others have been driven down in a damaged condition. Four of our machines are missing."

General Headquarters, September 15th, 12.50 p.m.

"Much aerial fighting has taken place. Four hostile machines were brought down in flames, and at least four others driven down damaged. One hostile kite balloon was brought down last night and one this morning.

"Our aeroplanes co-operated with advance of our infantry from a close height, firing on the enemy on the ground. Bombs were successfully dropped on three of the enemy's headquarters, and the railway station at Bapaume was also successfully bombed, much railway stock being damaged and one train destroyed."

General Headquarters, September 16th, 11.28 p.m.

"Further reports of the aerial fighting on the 15th bring the total number of German machines destroyed to 15. Another hostile kite balloon was brought down in flames this afternoon. Two more of our machines are missing, making six in all."

General Headquarters, September 17th, 12.47 p.m.

"Our air service successfully continued its attack upon enemy communications. Another enemy machine has been destroyed. Three of our machines are missing."

General Headquarters, September 18th, 4.5 p.m.

"During the past week, in the battle area only, 14 hostile aeroplanes have been reported as crossing our lines, while our machines have made between 2,000 and 3,000 flights across the enemy's lines."

General Headquarters, September 18th, 11.24 p.m.

"There was considerable aerial activity yesterday. Several enemy machines were driven down. Four of our machines are missing."

War Office, September 18th.

"*Egypt.*—A mobile column, composed of Anzac mounted troops, camel corps, with some artillery, left Bir-el-Abd of September 6th, with a view to carrying out a reconnaissance of enemy troops west of El Arish. . . .

"The attack appears to have been a surprise to the Turks, and our aircraft saw and fired on several parties of them, amongst whom were German officers, riding rapidly back to El Arish."

French. *Paris, September 12th. Afternoon.*

"Last night one of our air squadrons bombarded the cantonments of Semoncourt, the railway station of Metz, Sablons and the military factories of Dillingen. One of our pilots brought down an enemy aeroplane, which fell east of Radurt, on the Somme front."

Paris, September 13th. Afternoon.

"On the Somme front our aeroplanes fought 17 fights yesterday. Two German machines were brought down, one in the direction of Aizecourt, and the other in the neighbourhood of Moislains (north and north-east of Peronne). Four other enemy machines appear to have been badly damaged.

"Last night our bombarding squadrons dropped a large number of bombs. Eighty-seven bombs of 120 mm. were dropped on the railway station and hutments of Guiscard, where two explosions followed by a fire were noticed. Twenty-four bombs were dropped on the railway station of Roisel and on depôts at Hendicourt. Seventy-four bombs were dropped on enemy installations in the region of Etain, 32 on bivouacs in the region of Damvillers, and six on the railway station of Montmédy. During the same night one of our bombarding groups carried out the following operations: 105 bombs were dropped on the railway station of Thionville, 60 on the iron foundries of Uckingen (during this bombardment one of our machines covered the distance to the scene of the operations twice), six on the iron foundries of Rombach, and six on the railway line between Metz and Pont-à-Mousson."

Paris, September 14th.

"*Salonica.*—An enemy aeroplane was brought down by one of our machines near Burdovich."

Paris, September 15th. Afternoon.

"Four French aeroplanes dropped a large number of bombs on Sofia. One of the French machines, continuing the raid finally landed at Bucharest."

Paris, September 15th. Evening.

"On the Somme front our pilots particularly distinguished themselves to-day in numerous combats above the enemy's lines. Sub-Lieut. Guynemer brought down his sixteenth, Sub-Lieut. Nungesser his twelfth, Lieut. Heuriaux his sixth, and Sub-Lieut. De Rothefort his sixth aeroplane. Moreover, it is confirmed that in one of the recent fights Lieut. Deullin secured his sixth victory. Two other German machines, attacked at very short range, were forced to descend in a seriously damaged condition.

"On the Verdun front an enemy machine was brought down to the north of Douaumont. In the Vosges our anti-aircraft guns brought down a Fokker, which was dashed to pieces on the ground near Luses.

"Our bombarding aircraft showed great activity during the night of the 14th. A squadron of 10 machines dropped 77 bombs of 120 mm. and eight incendiary bombs on the railway stations and the lines at Tergnier and Chauny, and on the station and the huts at Guiscard. Many of the bombs found their mark. A big fire was observed at Tergnier and the beginning of an outbreak at Guiscard. Another squadron dropped 40 bombs on the barracks of Stenay, where several fires were observed, and 40 on the works at Rombach. One of our pilots made his way to Dillingen, in the valley of the Saar, in order to drop eight bombs on a large storehouse, where a fire broke uot. During the same night the blast furnaces at Rombach received 10 bombs, and the railway from Metz to Pont-à-Mousson four, which caused considerable damage."

Paris, September 16th. Afternoon.

"According to the latest reports, besides the nine German aeroplanes brought down yesterday on the French front, six other enemy machines were forced to come down in a damaged condition in their own lines after fights with our pilots. Two of the passengers in the German machines were killed.

"On Thursday night one of our air squadrons dropped 106 heavy bombs on the military establishments of Pont Faverger and Betheniville. A large fire broke out at Pont Faverger. Each of our machines carried out two trips. The same night the railway station of Conflans received 174 bombs of 120 mm., of which many struck their objective."

"*Salonica.*—One of our air squadrons dropped many bombs on Monastir."

Paris, September 16th. Evening.

"During the night of the 15th one of our bombarding squadrons carried out the following operations: Sixty bombs of 120 mm. and six of 200 mm. were dropped on the blast furnaces of Utkingen, 30 bombs of 120 mm. on the blast furnaces at Rombach; and, thirdly, others on the works in the Mondelingen district.

"During the same night two of our machines dropped 14 bombs on the railways south of Metz. The railway station of Bernsdorf and the stations of Spincourt and Longuyon also received 60 projectiles. Yesterday evening a German aeroplane dropped several bombs in Rheims. Two civilians, one of them a child, were killed and another was injured."

Paris, September 17th. Afternoon.

"Yesterday an enemy aeroplane was brought down in our lines at Biaches and another one at Belloy. It is confirmed that an enemy machine, which was attacked by machine-gun fire by Adjudant Lenoir, came crashing to the ground north of Douaumont. This is the eighth brought down by this pilot. It is also confirmed that Adjudant Dorme defeated his tenth enemy machine, which fell on September 15th between Brie and Ennemain.

"On Friday night two of our machines dropped 15 bombs of 120 mm. on the airsheds of Hatsheim. Last night 230 bombs were dropped on the railway station and aviation buildings of Tergnier, and 32 bombs on the railway station of Abbecourt. On the same night our bombarding squadrons carried out the following operations: They dropped 72 bombs of 120 mm. on the railway stations of Roisel, Epehy and Athies, and on the railway line between St. Quentin and Ham."

Paris, September 18th. Afternoon.

"Adjudant Tarascon brought down his fifth enemy aeroplane, which fell near Deniecourt. On the same day Lieut. Heurteaux brought down his seventh machine.

"Our air squadrons carried out various bombardments. Twelve bombs were dropped on the railway station of Nantillois, and 33 bombs were dropped on Villiers, Carbonel and Hovghy from a height of 800 metres, and caused serious damage."

Russian. *Petrograd, September 13th.*

"In the region of the town of Riga and the River Dvina the activity of the enemy's air fleet has increased considerably."

Italian. *Rome, September 13th.*

"Last evening enemy aircraft bombarded Venice, Pordenone, Latisana, Marano, Cervignano and Aquileia—wounding a few civilians and doing slight damage."

Rome, September 14th.

"Yesterday afternoon in unfavourable atmospheric conditions a squadron of 22 of our Caproni battleplanes, escorted by Nieuport chasers, made a raid on Lloyd's arsenal and the seaplane sheds near Trieste. One hundred and seventy-two bombs, equivalent to 5 tons of high explosives, were dropped on the railway establishments and the ships in construction. Large fires were observed. The aeroplanes were attacked by the enemy's anti-aircraft artillery and by seaplanes, but all returned to their sheds.

"Last night an enemy air squadron bombarded San Giorgio di Nogaro, Villa Vicentina, and other places in the Lower Isonzo district. One man was killed and some fires were caused.

"Enemy aircraft dropped bombs on Auronzo without doing any harm. Seaplanes directed against Ravenna were driven off by our batteries and aeroplanes."

Rome, September 15th.

"One of our aeroplane squadrons in air fight succeeded in bringing down two enemy seaplanes in the day off Panzano."

Rome, September 16th.

"Some of our Farman and Voisin aeroplane squadrons yesterday dropped bombs on the works and sheds of the narrow-gauge railway in Comignamo (Komen). Effective results were observed, and all our aeroplanes returned safely."

Rome, September 17th.

"Last night an enemy aeroplane squadron dropped 12 bombs on Mestre. No one was killed, and the damage done was slight. During an air fight in the Caporetto Basin an enemy aeroplane was brought down; one of the aviators was killed, the other captured."

Rome, September 18th.

"Enemy air raids on the Asiago Plateau, Caorio (Vanoi Cismon) and in the Biois and Cordevole Valleys are reported. Last night an aeroplane squadron again dropped bombs on Mestre. In these raids no damage was done and there were no casualties. Two of our aeroplanes dropped bombs on Mattarello and near Trento forced an enemy seaplane to land. Another squadron of our Caproni battleplanes, escorted by Nieuport chasers, dropped bombs on the stations at Dotteglianο and Scoppo, on the Carso, hitting the railway establishments, the adjoining stores, the water tanks and trains standing in the stations. All our aeroplanes returned safely, although chased by the enemy and fired on by anti-aircraft batteries."

Roumanian. *Bucharest, September 12th.*

"In aerial attacks the enemy aeroplanes dropped bombs on the town of Piatra-Neamtz, killing an old man and seriously injuring two children."

Bucharest, September 17th.

"Enemy aeroplanes dropped bombs on Constanza, killing two inhabitants and wounding four."

German. *Berlin, September 12th.*

"On the evening of September 9th an enemy airman who had apparently lost his way appeared in the region of Rottweil and dropped three bombs, which caused no damage, falling on uncultivated ground.

"Equally unsuccessful was an attack made by several aeroplanes upon the town of Saarburg, which is of no military importance, on September 10th.

Berlin, September 16th.

"Six enemy aeroplanes were shot down, including one by Lieut. Wintgens and two by Capt. Boelcke. The latter has now put 26 aeroplanes out of action."

Berlin, September 18th.

"Our airmen threw themselves against strong enemy air squadrons, and shot down in victorious fighting 10 enemy airmen."

"*Balkans.*—German seaplanes on the 16th inst. successfully attacked railway works and enemy columns in the Northern Dobrudsha. An enemy seaplane squadron at sea off Tuzla was bombarded. One of the seaplanes was hit. All our seaplanes returned safely."

Austrian. *Vienna, September 13th.*

"Last night a seaplane squadron dropped numerous bombs on the railway precincts and military works at Cervignano. Two large fires and one serious explosion were caused. Several full hits on the railway station were obtained.

"Another seaplane squadron the same night attacked the naval port of Venice. Hits by very heavy bombs were observed in the arsenal and the docks, near the gasometers, in the Fort of Alberoni, and in the docks of Chioggia. Despite very heavy bombardments, both seaplane squadrons returned safely."

Vienna, September 14th.

"On the afternoon of September 13th an enemy aeroplane squadron, consisting of 18 Caproni machines, escorted by three battle aeroplanes, delivered an attack against Trieste. To support the air squadron six enemy torpedo-boats and two motor-boats appeared in the Gulf. Numerous bombs were dropped, but only very inconsiderable material damage, and no military damage at all, was caused. As far as is known up to the present, one man was slightly injured.

"Naval Lieut. Banfield forced one enemy machine to descend after an aerial engagement, and forced it to retreat behind the enemy line. Our own aeroplanes and anti-aircraft guns scored hits on the enemy torpedo-boats.

"At the same time an enemy aeroplane squadron appeared over Farenzo and dropped about 20 bombs. Apart from the destruction of a field-hut, no damage was caused."

Vienna, September 15th.

"On the night of September 13th–14th one of our seaplane squadrons successfully bombarded military objects in Grado, and a second squadron the railway establishments and other military objects in San Giorgio di Nogaro. Several direct hits were made, and great fires were observed. All our aeroplanes returned in safety."

Vienna, September 17th.

"On the night from the 16th–17th one of our naval aerial squadrons dropped heavy bombs with success on the railway station at Mestre. All our machines returned unharmed."

Turkish. *Constantinople, September 12th.*

"On the 11th we successfully threw bombs on an enemy camp, causing fires."

Bulgarian. *Sofia, September 13th.*

"Our hydroplanes attacked the enemy's fleet in the harbour of Kavalla with success."

BRITISH AIR WORK.

The following was issued by the Admiralty on September 15th :—

"Between August 25th and 31st a series of attacks were carried out by naval aircraft upon the Bulgarian lines of communication beyond Kavalla. On the 25th the railway station and bridge at Buk were successfully bombed.

"On the 26th a similar attack upon the railway station at Drama resulted in the burning of a large petrol store and considerable destruction among the rolling-stock in the sidings. Bombs were also dropped on the billets of the enemy's troops at Doksat.

"On the 27th, Okgilar railway station, where the headquarters of the 10th Division were situated, was successfully attacked. The station buildings were set on fire and considerable damage was done to the permanent-way.

"On the 28th, Drama Station was again bombed. The station buildings were considerably damaged. On the same day Kavalla forts were attacked with excellent results.

"On the 29th a large body of infantry and transport concentrated at Porna were attacked. Considerable havoc was caused in the village and among the troops. A large fire was started among the stores in the transport park. The moral as well as the material effect of this bombardment seems to have been considerable, as a reconnaissance made on the following day showed that all troops, camps and transport had been removed from this district.

"On the 31st an attack was made on Angista Railway Station. Direct hits were made and extensive damage caused."

The following was issued by the Admiralty on September 16th :—

"In the early hours of the 15th inst. a squadron of naval aeroplanes successfully bombarded the enemy's heavy batteries near Ostend. All our machines returned safely.

"Between August 25th and 29th a series of attacks and reconnaissances upon the enemy railway communications in Palestine were carried out by a British seaplane squadron. These flights were made under somewhat hazardous conditions, due to the fact that the railway runs, for the most part, behind a range of mountains difficult for seaplanes to surmount. Bombs were dropped on Afuleh Junction, where considerable damage was done to the rolling-stock, permanent way and to stores in the vicinity. A railway engine and 14 carriages were also set on fire and destroyed. The railway stations at Tulkeram and Ardana, and an enemy camp 4 miles north-west of Remleh, were successfully bombarded and severely damaged.

"On August 26th a seaplane bombarded the railway station at Homs. This flight, carried out at a distance of 45 miles inland under extremely adverse conditions and through clouds low down on the mountains, was a singularly fine performance for a seaplane."

The following was issued by the Admiralty on September 18th :—

"On the afternoon of the 17th inst. a squadron of naval aeroplanes carried out a further attack on the enemy aerodrome at St. Denis Westerem.

"A large number of bombs were dropped with successful results.

"One of our machines was obliged to make a forced landing in Holland, and the pilot has been interned."

A German Version.

Berlin, September 18th.

"On the afternoon of the 17th inst. German seaplanes dropped a large number of bombs on hostile naval forces off the coast of Flanders. A hit was clearly observed on a parent ship, and one enemy airman was compelled by anti-aircraft fire to land on the Dutch coast."

With regard to this report, the Admiralty states that none of His Majesty's ships were hit or damaged in any way.

The following *résumé* of incidents in aerial warfare, extracted from recent reports of the Royal Flying Corps in France and Egypt, was issued by the Air Board on September 14th :—

"In Egypt on August 11th a B.E. 2c machine was completing a reconnaissance of the flanks and front of our positions when it was surprised and attacked from above and behind by two hostile machines, the first indication of their presence being the heavy machine-gun fire poured into it from close range. The pilot was shot in the jaw, the shoulder, left hand and left leg. He lost consciousness, but regained it when 500 ft. above the ground, and made a landing. The observer was shot in the chest and shoulder. The latter with great effort gave his report when lifted out of the machine and then collapsed. He died of his wounds some hours afterwards.

"One of our airmen in France attacked five hostile machines on August 16th. He engaged a Roland, causing it to dive, and then climbed and dispersed the remainder, two of which he forced to descend.

"In France on August 22nd an offensive patrol encountered a formation of about fifteen German machines, chiefly Rolands and L.V.Gs. These were engaged by our F.Es., assisted by one Nieuport Scout. The engagement became of a general nature, all our machines being engaged. One enemy machine was seen to side-slip and plunge to earth out of control, and was subsequently seen on the ground in a wrecked condition. Three others were driven down by the combined attacks of our machines, and appeared to be completely out of control, although lost to view before hitting the ground. One of these (a Roland Scout) was seen to be emitting clouds of smoke as though on fire. Three other machines were seen to land under control, and the whole hostile formation was completely broken up.

"The following is an account of a fight given by one of our pilots : 'While on defensive patrol we saw one of our F.E. 2B's doing photography. We followed this machine, going east of it, when we observed five enemy aircraft evidently intending to attack the photographic machine. We fired at them, opening fire at 500 yards. The enemy immediately split up their formation, diving and making off in all directions. We closed with one machine, firing two drums into it, and actually set it on fire, but after a few seconds the flames went out. We then engaged another machine, firing one drum at it, but could not get close to it. All five hostile machines made for the ground.'

"The escort to bombing machines of one of our Brigades encountered about 20 hostile machines flying in three formations, which were engaged separately. A Nieuport aeroplane first engaged the rear machine of a formation of seven Rolands, into which it fired 1½ drums at a range of about 15 yards. The enemy aeroplane was seen to dive to earth and turn over on its side. Our airman then turned his attention to five more Rolands, discharging two drums into one from underneath. The enemy machine turned and dived very steeply out of control, with fire and smoke coming out of the *fuselage*. The German formation was broken up, but our pilot got level with another machine and discharged the remainder of his ammunition into it. The enemy machine fell out of control and crashed on to some houses in the village below. During this time our F.Es. were busy fighting hard, and managed to disperse what remained of the enemy formations. Numerous enemy machines were seen to descend and land in all directions. The pilot above referred to returned to one of our aerodromes for more ammunition, and went back to the scene of the encounter, where he engaged and dispersed such enemy machines as had remained in the vicinity.

"On August 28th the pilot of the Nieuport Scout above referred to attacked four hostile machines. He manœuvred underneath the nearest, and fired one drum into it. The German immediately went down in an uncontrolled dive, closely followed by our airman, who fired another drum into it at about 20 yards' range, and saw the hostile machine crash to earth. Before this he had engaged three enemy machines, two of which were seen to make forced landings.

From Other Sources.

Mr. Laurence Jerrold, in the second of his series of articles on the Somme in the *Daily Telegraph*, says :—

"'In aviation the Boches have ceased to count,' said the young, dark captain at the aviation camp of B——, near A——, and the other young captain, this time fair, with a wisp of yellow moustache and a perpetual cigarette, echoed him. These French aviators are keenness itself. Most of them were engineers, architects, artists before the war. Since the war they have created entirely new methods, and have brought them to the pitch of perfection. 'What will you do after the war?' I asked. 'Oh, use the same methods for exploring and photographing Africa and Asia, or something of that sort.'

"In aviation 'les Boches n'existent plus,' everyone in this camp agrees. Since the Somme offensive no German aeroplane has ever dared to cross its own lines into French territory. The French have invented methods of air photography the perfection of which is almost miraculous. 'Does not the enemy do the same?' I ask. 'No, he never comes to photograph us because we never let him.

"'In July 58 German aeroplanes were brought down by the French attacking squadron. One of the new French machines alone brought down seven Boches, and not one of these machines was lost. These are the new attacking machines of extraordinary speed. There are other new French aeroplanes of great power. Some of these have lost a gunner killed, but all have always come back.'

"One of the French aviator-captains who showed me over the camp was the officer who had himself read the letter taken from a German aviator officer moaning over the incompetency of German aviation. That German aviation has ceased to count on the Somme is no exaggeration at all. One morning I saw over twenty French sausages lolling in the air, where they cast a seeing eye upon the German positions. Not a single German sausage was anywhere to be seen—none has been seen for weeks. 'The moment a German sausage comes up one of my men rises and puts an inflammatory fuse into the thing, and it bursts up,' said the aviator captain.

"It is the same with the aeroplanes—not one dares cross over the lines. The result is that the German artilleryman is blind. He fires over and over again at the same place upon which he had long ago trained his gun, but he can fire nowhere else with any knowledge. French mastery of the air on the Somme is an absolute fact. But in the air, on the Somme, the Boches are now powerless, and the French work their war machine absolutely peacefully. Their aviators have told them that they are safe from air attacks, and they know it is a fact.

"There are three kinds of aviation services, each very different from the other. The attacking aeroplane squadrons are the dare-devils and adventurers of the air. The infantry aeroplanes are scouts who lead attacks and hover over the foot soldiers as they leave the trenches for the attack, and from minute to minute send down information. The aviation photographic service, the third department, is the real eye of the army, and it is this service which by photographs keeps the fighting line informed from hour to hour of the enemy's positions.

"The fighting aviators are wild young chaps, who, in the intervals of risking their lives heroically, amuse themselves furiously. There is nothing to be done with them when they are off duty, and everyone then gives them their tether. Back to duty in their flying machines, they are once more dare-devils of the air. There is a new machine, several of which I saw flying off and returning, which can swoop down in a few seconds vertically upon an enemy. 'The machine is quite good,' said the aviator captain, 'but, unfortunately, after a few months of driving it one is apt to get a touch of heart disease.'

"The infantry aviators, who watch an attack from the trenches and report step by step the advance, are steadier chaps than the wild flyers of the attacking air squadron. They fly quite low over the foot troops, as the latter advance, and even go down to less than 200 yards from the ground. They are the infantry air scouts, and the information they send down gives commanding officers an assurance and confidence which could be equalled by no other means.

"The third air service is that which miraculously, as it would have seemed a few years ago, brings to Headquarters in a few minutes absolutely faithful photographs of all the enemy's positions. Think what this new service means. An aeroplane flies out over the enemy's trenches, and maps reproducing the exact plan of the enemy's trenches from the photographs taken are dropped into the French trenches. The aviator carries special cameras. The photographs are developed, and the lines of trenches are reproduced on a map. The map is printed by hand to the requisite number of copies by a delightfully smart process; copies of the map reach each commanding officer concerned. The perfection which has been attained in the taking of photographs, the reading of them, the reproduction and the printing off by hand of the maps, surpasses anything which could be imagined. There is nothing like this aviation camp in the world, and it has all been created since the very beginning of the war. Hundreds of young officers work there with a seriousness and a keenness which are admirable. It is one great, perfect machine, and in all—in the daring flyers who dash over the enemy's lines, and in the men who develop, read and print these photographs, upon which so much, indeed everything, depends—there is the same steadfast purpose and the same enthusiasm.

"But they only count by results, these young Frenchmen, who have made a business of war, and who make it thoroughly. 'Don't the Germans take the same war photographs?' I ask. 'They would if they could, but, you see, we don't let them. *L'aviation Boche n'existe plus.*"

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A Long-Distance Flight in America.

On August 25th, Pilot Victor Carlstrom made flights at Newport News, Va., which so far established the best records yet made to win the Marine Flying Trophy and the $1,000 cash prize given by Mr. Glenn Curtiss. Carrying a passenger the entire time Carlstrom flew a twin-motored JN hydro-aeroplane 661 miles, using a total flying time of 8 hours 41 minutes. His course was between two points 25·44 miles apart, and most of his flying had to be done with aid of compass, as a heavy fog had settled over the water. The contest opened April 15th, and will close October 31st.

A Danish Trans-Atlantic Project.

Lieutenant Pollner, a young and well-known Danish military aviator, has planned to make a record by crossing the Atlantic, says the *Daily Telegraph* correspondent at Copenhagen. A Danish flying-machine expert states that he will be able to carry out the plan by means of a machine supplied with a motor of 350 h.p. The distance from the Faroe Islands to Newfoundland could, he states, be made in about 30 hours, and the whole trip to New York in 48 hours.

The Cost of a Zepp. Raid.

Some interesting speculations as to the cost of the last Zeppelin raid were given by M. Louis Forest in the *Matin* last week. Basing his observations on the principle that Germany entered the war as a business proposition, M. Forest puts the following on the debit side of the balance-sheet:—

£1,200 for petrol.
£600 for oil.
£1,000 for bombs.
£3,000 for refits and repairs.
£250 for Wolff telegrams.
£60,000 for the loss of a Zeppelin.
£10,000 for pensions; and
£10 for Iron Crosses.

He credits to the other side of the account two British lives lost, and, assuming that he is Hindenburg making out a report to the Kaiser, proceeds:—

"Your Majesty will readily perceive that this expedition gives us something substantial to go upon for the solution of the problem before us, and which alone can gloriously terminate the war, namely, the destruction of England. The loss of two Englishmen having cost us close upon £80,000, a simple calculation suffices to show, taking the population of Great Britain in round figures at 46,000,000 of souls, that in order to kill off the lot we shall not be obliged to spend more than £1,840,000,000,000. I venture to think that there will be no difficulty in obtaining this sum from the Minister of Finances, especially when it is considered how reasonable it is compared with the results it will achieve.

"The money part of the problem settled, there only remains one small point to be got over. The destruction of two Englishmen having cost us the lives of 20 Germans, a superficial mind might imagine that we ourselves shall all be wiped out before we have encompassed the death of every inhabitant of Great Britain. Seeing, however, that the permanent Committee of German Professors established to deal with the problems of the war has always been able to demonstrate that what must be done for the pursuance of German aims can always be accomplished, I do not doubt for a moment but what the same Committee will discover a formula proving that this particular point is only an apparent difficulty, and not of a nature that need for a moment trouble or thwart our activity.—Hindenburg."

Roumanians Bring Down a Parseval.

DETAILS of the bringing down of a Parseval which raided Bucharest are given in a despatch from the *Daily Chronicle* correspondent at the Roumanian capital. He says:—

"We were not allowed to wait long before war was brought home to us here in the capital. We had gone quietly to bed at 10 o'clock on the Monday night after that exciting Saturday. Soon after 1 the mournful tolling of the big bell of the Metropole and the police whistling which succeeded it let all Bucharest know it was the announcement of an aerial visit. Though orders were for all to retire to their cellars (if they had one), everybody crowded in the lightest of raiment into the streets to see the fun.

"A Parseval and an aeroplane, coming from the direction of the Danube—that is to say, Bulgaria—had been signalled, and their route to the capital was heralded by the sound of the anti-aeroplane and machine guns fired at the enemy craft. On they came, but only to be caught up very quickly by the searchlights. Shells flashed round the airship; she hesitated, turned, and, pausing once more, moved off riverwards, many who watched her declaring that her nose had dipped.

"Now this is true, though for certain reasons the Government are silent on the matter. The Parseval, which has been seen by a large number of people, is lying a mangled, shapeless mass, outside Bucharest, with a cordon of troops round it. It is of aluminium. Of the fate of its crew accounts differ. Some state that all (10 they were) were killed and horribly mutilated; others say but three were dead; the rest, injured, are in a hospital (which is kept secret). They were Germans and in German uniform, and the craft came from Sofia, and one café reason for keeping the matter quiet is because this country has not actually declared war on Germany or Bulgaria.

"In any case it is a splendid feat of arms, and that by an army wholly new, except in theory, to such work. The very guns that threw the shells that brought down the airship were only lately constructed from plans in the army's own workshops here in Bucharest.

"So, tragically for the invaders, ended the first air attack on Roumania. The actual damage from bombs dropped was the corner of a small house knocked down, where a girl had a slight temple wound from a falling brick. Several bombs buried themselves harmlessly in the earth.

"The aeroplane made off, but came back the following night, apparently searching disconsolately for its companion, but disappeared when fired on."

A German Aeroplane in Holland.

BEARING on its tail the number 97, besides having a mark A20-16, a German aeroplane has landed near the village of Roosteren, in Holland. The pilot, an officer, who said he had been making a reconnaissance and his base was Cologne, has been interned. The aeroplane was armoured, and carried a machine gun and photographic apparatus.

Precautions in Wilhelmshaven.

AN announcement, signed "Festungskommandant," has been published in the *Wilhelmshaven Zeitung* ordering more stringent precautions in the naval ports against air attacks. No more lights are to be shown in streets, yards, gardens, private or public buildings. Curtains and blinds which have hitherto been considered a satisfactory precaution are now regarded as insufficient. Illuminated signs are prohibited, and all the special light permits are withdrawn. Shop windows are to show no more than just sufficient light to enable customers to distinguish the goods. Rehearsals of arrangements for the safety of the public will be held nightly until further notice."

Another Fairy Tale.

THE notorious Wolff agency must look to its laurels, for the "German Newsagency for Foreign Policy" has eclipsed all the Wolff fabrications.

Its Christiania correspondent has interviewed a Norwegian merchant, who says that he spent the night shivering in the cellar of big business offices near St. Pancras in the company of the King, the Queen and the Duke of Connaught, who had just arrived at St. Pancras but could not get to Buckingham Palace because the streets were torn up by Zeppelin bombs. The merchant adds that the King remained for an hour and a half in the cellar, only speaking three words. He adds that London is a maze of underground bars, business offices, shops, and theatres, all advertising themselves safe from Zeppelins, and that practically every house in London is an ammunition factory.

Apparently the agency has reached the limit, for the story arouses some mild doubt even in the mind of the *Hamburger Fremdenblatt.*

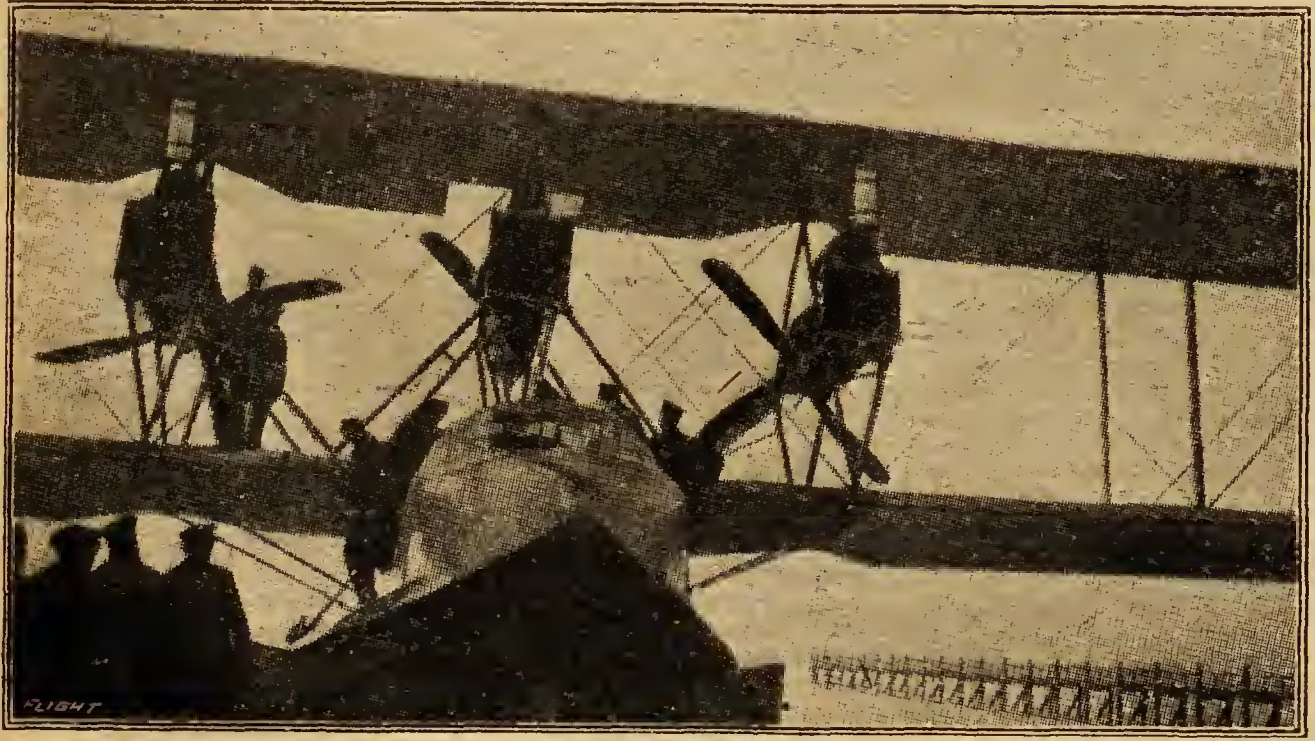
Count Zeppelin Endorses "Frightfulness."

THE *Norddeutsche Allgemeine Zeitung* says that the following "explanation" that he is in no way hindered in the use of his airships against England, has been sent by Count Zeppelin to the Imperial Chancellor, dated September 5th:—

"I am informed that in the course of the agitation carried on by your Excellency's enemies it is continually asserted that I have stated it to be my view that from consideration for England or from a desire not to render an understanding with England difficult, and thus from some political motive the greatest possible effective and ruthless use of Zeppelins is not being made.

"I am convinced that the employment of Zeppelins is in nowise hindered by any political or other considerations. I need not tell your Excellency that I am in nowise a party to this misuse of my name. I sincerely deplore it, and I leave it to your Excellency to make any use you desire of this explanation."

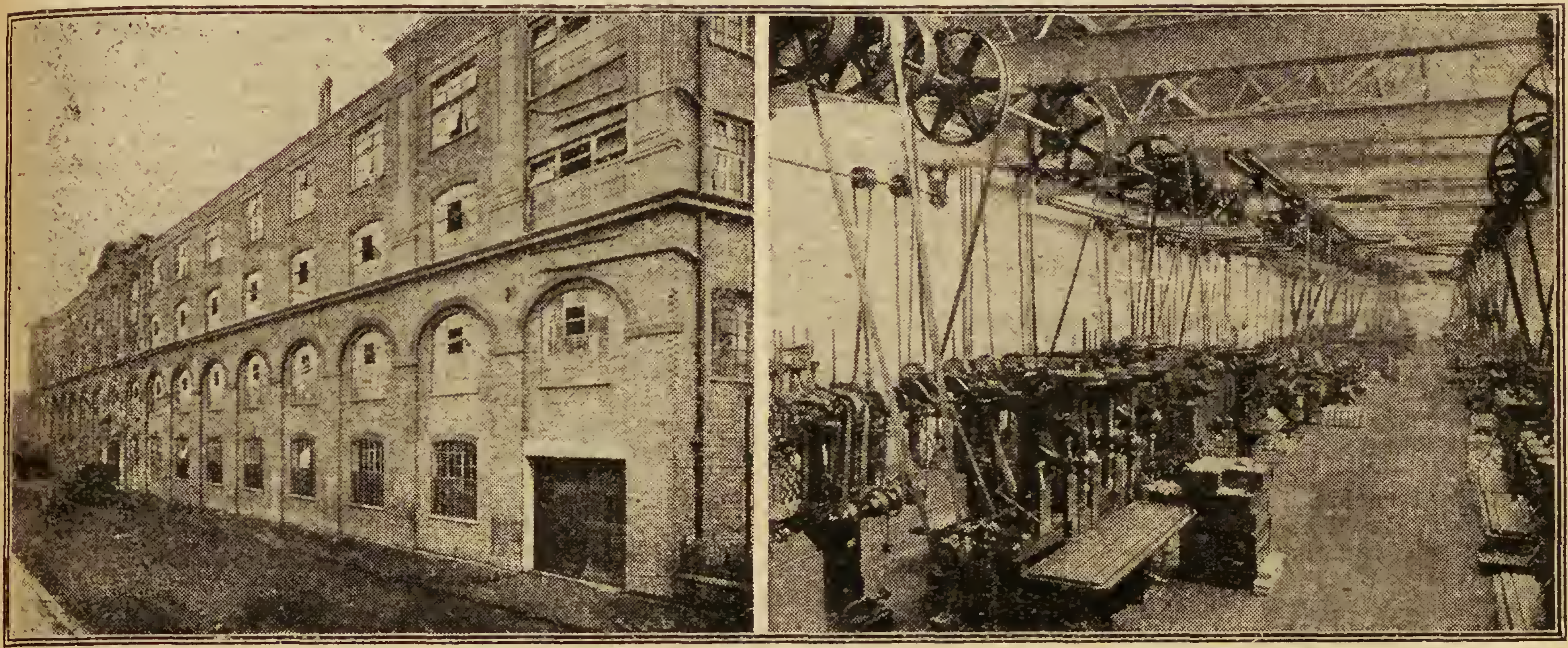
Commenting upon this the *Deutsche Tageszeitung* says that "as a whole or in detail does not give one the impression that it was spontaneous, and solely on Count Zeppelin's initiative."



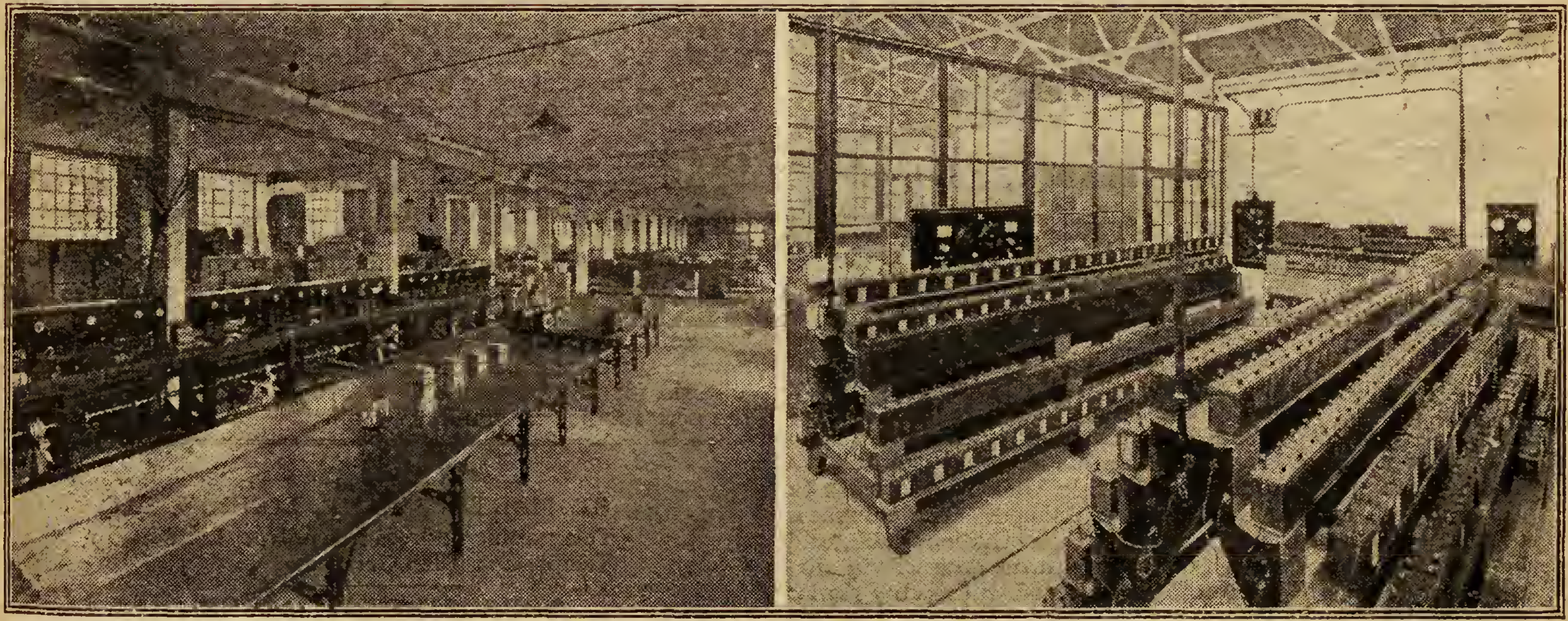
A Modern Battle-Cruiser of the Air.—The Curtiss "Super-America" flying boat, which is capable of rising from, and alighting on, very rough seas. It is equipped with three high-powered Curtiss motors. *(Photo. by courtesy of "Flying.")*

C.A.V. DYNAMOS, THEIR MAKERS & OTHER MATTERS.

Probably the most severe test to which a factory organisation can be put is for it to be expanded and enlarged to many times its original size during a few years. Through such a test, or rather series of tests, the firm of C. A. Vandervell and Co., the electrical specialists, has come through with flying colours. Those who were acquainted with the original works would be amazed at the wonderful transformation which the last few years have seen down Warple Way, and the process is still going on. Yet as one walks through the offices and through shop after shop, with its rows of machine tools, and notes the well-ordered way in which process follows process from the time the idea is first sketched out on paper until the final stage of production is achieved, it is difficult to realise that one is not viewing a modern factory all fresh from the builder's hands. It is a tribute to the splendid foresight of those who have guided the destinies of the C.A.V. works that the growth in the size of the works and its organisation has gone on so smoothly and continues to do so. Having utilised all the site around the original works, the firm have been fortunate in obtaining space just across the road, where a new large factory is already in use, and further extensions are going up. Some idea of the extent of the works can be gathered from the fact that they now cover some 7½ acres, while the number of employees is round about 3,000.



THE C.A.V. WORKS.—The east front of the main building, and on the right a view of a machine shop.



THE C.A.V. WORKS.—The dynamo shops on the left and accumulator charging department on the right.

Of course, at the present time the production of those electrical specialities which have made the C.A.V. trade-mark famous the world over, is largely held up by more important Government work, but at the same time the output of accumulators, magnetos and aeroplane engine starters is, to put it very mildly, quite respectable. And the firm is not sitting still like Mr. Micawber waiting for something to turn up. Immediately the time comes they will be ready to go full speed ahead on electrical equipment, and there is little doubt that they will win through. All their staff are being trained in doing highly delicate work, and here a word may be said as to the success which has attended the firm's efforts at the dilution of labour. For many of the processes girls are now enormously employed, and are doing splendid service. For delicate work of a repetition nature which is such a feature of electrical manufacture, their quick and delicate touch lends itself very readily, and in the C.A.V. works considerable attention is given to details which will not only facilitate their work, but also eliminate, as far as possible, opportunities for making mistakes. Thus, to mention but one instance, the armature shafts of all models of the C.A.V. lighting dynamos are made the same size, but the windings differ, of course, and the insulation on the armature wire of each model is given a distinctive colouring.

The same thoroughness is seen in connection with the selection and employment of materials, a well-equipped testing and research laboratory being kept fully employed testing not only the quality of the material in use but also investigating the possibility of utilising new ideas which may be suggested from time to time.

Throughout the works every effort is made with a view to attaining the maximum efficiency of the employees whatever position they occupy. Thus, those in charge of various operations or departments have their own offices so that they may carry out their work undisturbed. The health of the workers is wisely treated as of most primary importance, all the shops being noticeable for the amount of light and ventilation which is afforded. This aspect of the entire works struck us in a very marked degree. In winter the air is heated, while in summer the temperature is kept down. In those shops where there is a lot of dust collectors are arranged to suck up the dust as fast as it is made. Shower baths and wash-houses of most up-to-date character are also provided. A new departure which is sure to be greatly appreciated is a large canteen, now nearing completion. It includes separate dining halls for men and women either of which is large enough for concerts, &c. As a matter of fact, even before the building is finished it has already been decided to extend it, so confident are the firm that it will be appreciated by their workers. This new building is no flimsy structure suggesting a temporary institution. It is not only very handsomely built, with a very attractive elevation, with red tiled roof and stone façade, but the interior design of the roof is particularly pleasing, and as a whole is typical of the substantial character pervading the whole organisation.

In the C.A.V. works Mr. C. A. Vandervell has, indeed, erected a monument to his name, and is to be heartily congratulated on having brought together into the business such a number of highly efficient co-workers, headed by Mr. A. Goodwin, who is not only highly respected, but who has with him the goodwill of every employee in the large range of buildings. Mr. Steel, the works manager, is another man who has proved such a strong pillar in the building up of the organisation, this side of his work amounting almost to genius. It is long since we had so pleasurable an experience as the inspection of the developments which have taken place at the Vandervell works, and if ever a business slogan were justified that of the firm surely is, which reads : "If you see the signature C.A.V. stamped on an accumulator, you know it is the best." And this applies to everything turned out from the Vandervell factory.

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The Engineering Timber Co., Ltd.

NOTE should be made of the fact that the Engineering Timber Co., Ltd., have now moved into their new offices at 11, Victoria Street, London, S.W., next door to their old headquarters. The telephone numbers remain as before, Victoria 5073 and 4210, and the same applies to the telegraphic address, Entikosil, Vic, London.

The Lodge Sparking Plug Co., Ltd.

ANOTHER move is that of the Lodge Sparking Plug Co., Ltd., who from Saturday next, September 23rd, will have their registered offices at their new factory in St. Peter's Road, Rugby. All communications should be addressed to the Lodge Sparking Plug Co., Ltd., Rugby. The telegraphic address is "Igniter, Rugby," while the telephone call is Rugby 235.

An Addition to the Castrol Ranks.

MR. D. W. THORBURN, who is so well known in circles aviatic, has joined Messrs. C. C. Wakefield & Co., Ltd., as Chief Assistant to Mr. Frank Fisher, the manager of the Motor and Aviation Department. The popularity of Castrol and other Wakefield products has so greatly increased the demand that of late it has been a severe tax for even Mr. Fisher's boundless energy and enthusiasm, and the co-operation of Mr. Thorburn, with his originality and ability, should provide considerable relief.

A Tribute to Barimar Welding.

FROM time to time reference has been made in these columns to the splendid work done by the welding department of Messrs. Barimer, Ltd., 10, Poland Street, W., who have made a speciality of this kind of repair for a long time. Striking tribute to the effectiveness of their system in dealing with extremely delicate welding operations has recently come to hand in connection with certain German machines. Writing the other day to the firm, the owner of a large industrial concern in the Midlands said :—"We have a particularly delicate welding job we should be glad to have your opinion upon. Up to the present, as far as we are aware, there is no firm in the whole of England who can successfully do it. We are given to understand that the men who do this work in Germany are trained to it from childhood. The thickness of the metal is certainly not more than the ·005 inch, and inasmuch as the insulation of the apparatus goes within one-eighth of an inch of where the weld is, you will readily realise that a man has to be exceptionally expert if he is able to avoid damaging the article."

As there were 1,000 of these machines needing repair, Barimar, Ltd., were given a trial order. Fortunately, there was no difficulty in proving that their experts were quite equal to the emergency. The perfectly adjusted apparatus was soon on its way back to the owner, and a contract was immediately entered into in respect of the rest of the installation.

This is but another instance of the way in which Barimar, Ltd., have come to the rescue of firms who were threatened with having their output curtailed owing to the breaking of machinery of foreign origin which could not be replaced. Working at such high pressure as many machine tools are at the present time it is inevitable that breakages will occur, and it is good to know of a firm which can deal with such repairs promptly and effectively.

A useful range of steel bins and counter made by Messrs. Joseph Sankey and Sons, Ltd., of Hadley Castle Works, Wellington, Shropshire. These can be supplied in various combinations and sizes specially suitable for use in aircraft works and hangars.

After Hours.

IF we were asked to name the most delightful entertainment at the present moment in London, we should without hesitation give the palm to "The Happy Day" at Daly's. We are hardly surprised therefore to learn that, commencing from Monday, September 25th, Mr. Evett has arranged at Daly's to have an extra matinée on Mondays, in addition to the Wednesday and Saturday matinées. He considers, however, that nine performances per week would be too severe a strain for the artistes, and has therefore decided to cancel the performance on Monday evenings.

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EDITORIAL COMMENT.

The Latest Zepp. Raid.

LAST Saturday night's raid on London and other parts of England, and its result of two of the latest Zeppelin airships lost to the Germans, may well give the enemy food for reflection. The reports so assiduously spread by the Hun lie-factory of the terrific destruction wrought by German raiding air-squadrons, have, as we have so repeatedly noted, by the very colossal mendacity of their statements, seriously discounted them in the eyes of those they were meant to impress. London has repeatedly been laid in ashes—yet the raiders make the "ruins" their objective time after time. So with Hull, Grimsby, and other important centres. Each time Hun aircraft visit these shores these places are again destroyed or seriously damaged. Always, too, they have reported that "all our airships returned safely to their base." Even in the case of the destruction of what has become known as the Cuffley airship, the lie-factory did its best to conceal the truth. But whatever reports may be issued for the consumption of neutrals and their own people, the German higher command knows the truth. It knows more and more that in proportion to the efforts made the real damage inflicted has been small and has certainly not affected the military situation by one iota. And that, too, when for long enough the invading aircraft were almost free to come and go without let or hindrance. Now that this is no longer the case, they must be more than ever wondering if the game is really worth the candle.

Two in one night is a high price to pay for practically nothing. Let us hasten to say that we are far from regarding the loss of life as negligible. We deplore the toll of civilian life—and particularly the lives of the women and children as deeply as anyone—but we must view these matters in their true perspective. If the losses were ten or a hundred times as great as they have been, the grim resolve of the nation to pursue the war to its bitter end would not be abated one jot. Rather would it be strengthened to crush an enemy who makes war on women and children and glories in the exploits of its "heroes of the air."

From the public's point of view it is gratifying to know that at last our aerial defences have reached a point when the enemy cannot contemplate a continuation of "frightfulness" without grave risk to himself. But here again we must preserve our sense of proportion. It is officially stated that about twelve airships participated in the raid. Of these two were destroyed, and, presumably, ten safely returned to their base. That means, roughly, 15 per cent. of casualties, which is materially low. Morally, the proportion may be much higher than that figure, but that is not the point. It is certainly not enough that the enemy may be left to calculate that he can continue to carry on his baby-killing raids in the practical certainty that, if his luck is out and ours is most distinctly in, he *may* lose 15 per cent. of his craft. We have undoubtedly improved our defences—and our luck has been better—but we cannot afford to relax the effort until they are in such a state of efficiency that the Hun must reckon on the *certain* loss of 50 per cent. whenever he has the temerity to attempt an attack on this country.

At the same time, we congratulate the officers and men of our gallant air services on their fine achievement of Saturday and Sunday last. Even before that, it is a matter of knowledge that the Germans were seriously asking whether aerial frightfulness is all they were told. The loss of two of their latest and best Zeppelins will certainly give them more to think about.

* * *

The New R.A.F. Chief.

There is no particular merit, when one is in possession of absolute knowledge beforehand, in suggesting some particular appointment merely for the self-afforded opportunity of patting oneself on the back as being more or less the author of the accomplished fact when it is announced. We, therefore, refrained from saying anything about the appointment of Mr. Henry Fowler to be Superintendent of the Royal Aircraft Factory until such time as official authority was given for its announcement. Our reticence was not due to ignorance, but rather to a sense of obligation to "play the game."

The selection of Mr. Fowler for the post seems to us to be a singularly fortunate one. It is as chief mechanical engineer of the Midland Railway that Mr. Fowler is best known to the world of engineering. To automobilists he has long been known as a keen observer of the development of motor traction. More than that, he has identified himself with the movement very closely by assisting in many of the early trials and tests of the days when the motor car was striving for recognition as the coming method of locomotion. He was officially connected with the early trials promoted by the Liverpool Self-Propelled Traffic Association, and later, was closely associated with practically all the trials promoted by the A.C.G.B.I., as it then was. Thus he brings to his new work at the R.A.F. a wide knowledge of the internal combustion engine, which cannot but be extremely helpful.

It is not only, however, as a very able engineer that the new chief will prove so great an acquisition to the R.A.F., but as an organiser and a powerful driving force. Since the formation of the Ministry of Munitions, Mr. Fowler has been acting as Director of Production, and it is an open secret that the wonderful results achieved in production have been in no small measure due to Mr. Fowler's forceful personality and his habit of indefatigable work. For if he is one thing more than another he is a worker of workers, and a man of phenomenal vitality. He has a charm of manner, which creates a willingness to work with him, but he is insistent that that work shall fulfill its purpose. That he is embarking on a difficult task will only make him the more determined to make the R.A.F. what it ought always to have been. That he will succeed we thoroughly believe.

* * *

The Air Services Fund.

Does it appeal, we wonder, to those who read in their daily papers that the control of the air has definitely passed to our airmen, that there is a price to be paid day by day for its retention? Kipling wrote:

"If blood be the price of admiralty,
Lord God, we ha' paid in full."

And the price we have paid, and are paying, for the admiralty of the air has been a bitter one. Not that we grudge it—it has to be paid that we may remain a nation and an Empire—but we can at least do what is in us to see that the dependents of those who have paid the uttermost price for us do not go wanting. Let us remind our readers that there exists an Air Services Fund, administered by the Royal Aero Club, which exists for this and cognate purposes. Further, we would impress upon them that the need for funds will increase, since the development of the aerial war means that more of the rank and file of the air services are figuring in the casualty lists than during previous months of the war. The coming of the fighting aeroplane meant the employment in the air of more non-commissioned officers and men than when the work was almost confined to reconnaissance and raids. Needless to say, the more employed on the hazardous work of war in the air, the heavier must be the losses, and it is up to those most closely identified with aviation to make it their urgent business to put the Air Services Fund in a position to carry out the objects for which it was inaugurated.

* * *

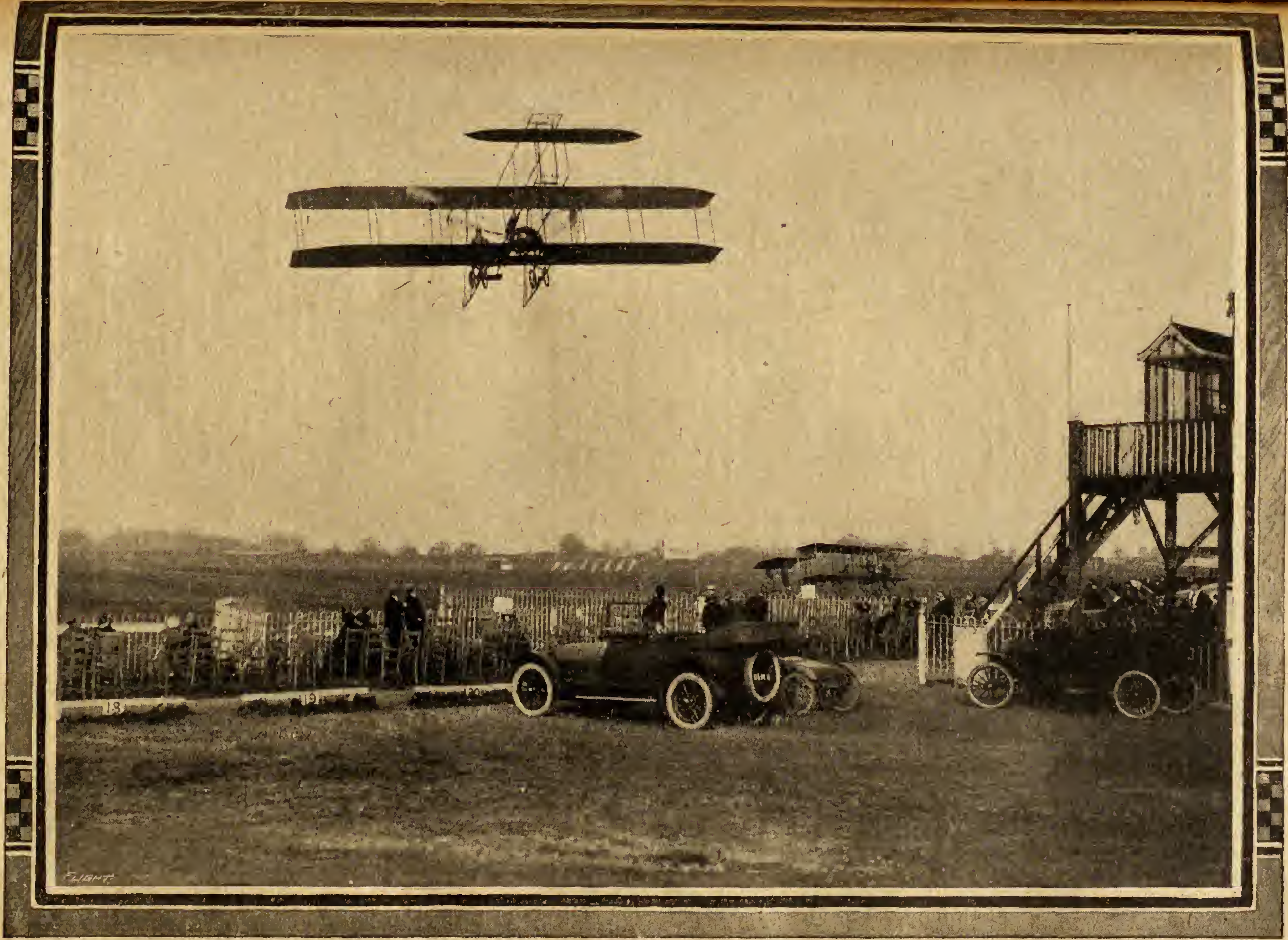
A Scandal of the First Magnitude.

It is not often that we concern ourselves with matters that are not directly associated with the movement with which this journal is primarily identified. There are occasions, however, when it is impossible not to express strong opinions upon subjects that normally lie outside our sphere. We have read with astonishment and disgust of the action of the authorities in the matter of the taking over of Adastral House—otherwise De Keyser's Hotel—for the work of the R.F.C.

We would specifically exclude the R.F.C. from any odium which may attach to our remarks, as, of course, they are innocent "holders" and pitch their tent where the lawyer officials indicate.

Briefly, the facts are stated to be as follows. The War Office, acting under the powers it possesses under the Defence of the Realm Act and other authorities, took over the premises for the housing of the Royal Flying Corps—which it admittedly had a perfect right to do. The building contains about 400 rooms, and is valued at some £300,000. There is a debenture debt of £144,000, and at the time of its appropriation by the War Office, the affairs of the hotel were being run by a receiver for the debenture holders. Naturally, the question of the rent to be paid came up for discussion between the receiver and the authorities, and a rental of £19,000 per annum, being 5½ per cent. on the valuation, was suggested as being a fair figure. The discussion proceeded in an apparently amicable manner. It progressed to a point at which the Office of Works asked if the proposed rental could not be reduced to £17,000 per annum.

All of a sudden, the negotiations took a completely different turn. The Controller of Supplies wrote saying that it would be to the advantage of all concerned if the whole question of compensation should be referred to the Defence of the Realm Losses Royal Commission. The "Duke Commission," as that body is known, held that the Crown, being entitled by its prerogative rights to the possession of any premises it might select, "it would be a derogation of those rights to pay any rent whatever!" The Lands Branch of the War Office later followed this up by the astounding dictum, which has already been so shamefully made use of in this war, that: "Compensation is made *ex gratia*, and is strictly limited to



A REMINISCENCE OF HENDON.—Mr. Kenworthy, on a Beatty-Wright, returning to the Aerodrome after executing many thrilling evolutions just out of the range of the camera the actual monetary loss sustained." The irony of this is apparent when it is recalled that the affairs of the hotel are in the hands of a receiver and that it was making no profit at the time it was taken over. The net effect of the Government's contention is that neither the debenture holders nor the shareholders are to receive a penny piece by way of compensation for the use by a public department of their premises!

A worse example of the doctrine of confiscation by a Government of private property it would puzzle Germany or Turkey to produce. It is a fair sample of what has been going on and what has to be expected in the future for our complaisant acceptance of rule by the lawyer caste. Steeped to the lips in feudalism and brought up to regard the quibble as an art to be cultivated and excelled in, there is no length to which the lawyer politician will not go, no depth to which he will not descend, so long as he can keep within the four corners of the law he himself has evolved and, having evolved in all its devious phrasing, proceeds to interpret to suit himself.

Fortunately, there is a precedent which will probably assist in setting aside the preposterous idea that the Crown may possess itself of the property of the individual and pay nothing for it, or, alternatively, make a payment to be assessed by itself as "an act of grace." We refer to the similar case in which an aerodrome was taken over by the War Office, the owners of which had to fight their way through the Courts in defence of their rights. After losing in the Court of King's Bench and the Court of Appeal, they proceeded to the House of Lords, but before judgment was asked for, the Crown discovered that it was wrong, agreed to pay compensation and thus avoided a possibly adverse decision which would have been binding as a precedent. In commenting upon this case in our issue of July 23rd, 1915, we said :—

"If, as it would appear from the arguments on behalf of the Crown, upheld by the Court of Appeal, the prerogative of the Crown legally entitled it to make this very one-sided bargain, the sooner it is set right the better. True, it was admitted that 'as a matter of grace' the King might consider the giving of compensation. But surely in this year of our Lord nineteen hundred and fifteen we should have done with such 'acts of grace.' The loyal citizen desires no such act of grace. His desire is to serve his King and country in their need to the best of his ability, coupled with the right in return for justice as an individual suffering by necessity of circumstances in the common cause of the community. And that should carry with it compensation for compulsory acquisition—always provided there is anything to show there is compensation due.

"In this connection we have no knowledge of the particular case as to whether any or how much compensation might be morally due, or whether it may be a case of relief to the owner to acquire the premises. We express no opinion whatsoever therefore on this point. But that the Crown should be at liberty to seize any and all property at its own sweet will, without even an iota of right on the part of the owner to claim compensation for whatever it may be worth, appears to be going away back to the dark days of feudalism."

These words apply with equal force to the case at present under notice. This doctrine of the lawyers that the individual is to be made to pay what should be a charge on the community requires to be set right. If the Crown—or, rather, those who do in the name of the Crown acts which the Crown itself would be the first to disown—cannot be brought to recognise the difference between *meum* and *tuum* through the Courts, then it is for the non-lawyer element in Parliament to set the matter right legislatively. The country has stood a great deal in its anxiety not to hamper the administration, but it will not stand barefaced confiscation.

* * *

Air Raids and Munition Workers.

The following announcement was issued by the Ministry of Munitions on September 26th :—

"If a munition worker (as defined by the Munitions of War (Amendment) Act, 1916, is, on or after October 1st, 1916, killed or injured by hostile aircraft, or by the measures taken to combat them, whilst upon the premises of the factory in which he is employed, and if the injured worker or his dependents on proceeding under the Workmen's Compensation Act, 1916, fail to recover compensation, His Majesty's Government undertake to pay compensation on the scale of the Act."

An American View.

In view of the mendacious fables sent out from Berlin regarding the results of Zeppelin raids on England, it is interesting to note the following comment by the *New York Times* on Sunday's raid :—

"In view of the German loss of life and the cost in the latest Zeppelins, one may predict that the German idea of crushing the British by the latest species of frightfulness will be apt to cool a little. As a rule, on the day after the raid the Berlin Government Press Bureau sends a long descriptive wireless bulletin to America, and doubtless to other neutral countries, describing the damage done to 'fortified towns, ammunition factories, dockyards, ships in harbour,' and so forth—a long list of strictly military damage. This time no such wireless has arrived, and when it does will be little credited—first, because the British bulletins already published here have been found accurate, and next, because the German accounts—even those of the latest battles—have been so extravagantly inaccurate as to excite ridicule."

The *New York Tribune* says that, according to information which reached them a few weeks ago, Germany has less than twenty Zeppelins of the dimensions of those destroyed.

The Seizure of the "Prins Hendrik."

An exciting incident at the seizure of the Dutch mail steamer "Prins Hendrik" by German torpedo-boats was the appearance of an aeroplane, or, according to a German semi-official report, three aeroplanes, which attempted to bomb the torpedo-boat escorting the steamer through the minefield after she had been released from Zeebrugge. The German account states that the torpedo-boat was undamaged, but that the mail steamer was slightly damaged and three of the crew wounded.

The Danish Trans-Atlantic Project.

To the Copenhagen correspondent of the *New York Times*, Ensign Pollner has given some further details of his proposal to fly across the Atlantic. The seaplane is to be built in Denmark by engineers from the Polytechnic Academy, Copenhagen, and will have two motors of 160 h.p. each. It will carry a fuel supply of two and a half tons. The young officer means to start from Copenhagen early in July, flying directly to the Faroe Islands, and waiting his chance there to take the trip across the sea. Severinsen, a mechanical engineer, will accompany Pollner, who is already busy on his preparations.

The British Air Services

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

The following appeared among the Admiralty announcements of September 21st :—

Flight - Sub - Lieutenant (Temporary).—R. H. Collet, D.S.C., specially promoted Flight-Lieutenant (Temporary), for war service, seniority Sept. 19th, and reappointed. The under-mentioned have been entered as Probationary Flight Officers (Temporary), and appointed to "President," additional, for R.N.A.S., seniority as follows : O. C. Le Poutillier and N. D. Hall, Aug. 21st S. G. Wingfield, J. T. C. Gray, R. D. Sach, C. E. Fox, H. F. Airey, W. R. Sims, C. L. Nightingale, A. T. Maxwell, D. Hammond and R. B. Picken, all Sept. 24th. Temporary commissions (R.N.V.R.) have been granted to the under-mentioned, seniority as follows : Lieutenant : C. E. Lygo, Sept. 20th. Sub-Lieutenants : A. J. Long, Aug. 10th ; W. Tod, D. A. Duncan and T. Rogers, all Sept. 20th.

The following appeared among the Admiralty announcements of Sept. 23rd :—

B. Davies and H. W. Bamber have been granted temporary commissions as Lieutenant (R.N.V.R.) and Sub-Lieutenant (R.N.V.R.) respectively, seniority Sept. 22nd, and both appointed to President, additional for R.N.A.S.

The following appeared among the Admiralty announcements of September 25th :—

Surgeon G. G. D. Fergusson to the "President," additional, for Chingford Air Station, to date Sept. 23rd.

Royal Flying Corps (Military Wing).

The following appeared in the *London Gazette* of September 19th :—

Flight Commanders.—From Flying Officers, and to be Temporary Captains whilst so employed : Lieut. W. E. Collison, Special Reserve ; Aug. 28th, 1916. Temporary 2nd Lieut. R. Chadwick, General List ; Sept. 5th, 1916. Lieut. J. A. G. de Courcy, R.A. ; Sept. 9th, 1916.

Equipment Officers.—From Assistant Equipment Officers, and to be Temporary Captains whilst so employed : Lieut. V. W. Eyre, Special Reserve ; July 26th, 1916. Lieut. J. W. Griffith, Special Reserve ; Sept. 5th, 1916.

Flying Officers.—Temporary 2nd Lieut. C. M. Clement, General List ; June 16th, 1916. June 17th, 1916 : 2nd Lieut. (Temporary Lieut.) M. C. Hayter, 1st Co. of Lond. Yeo. (T.F.) ; Lieut. W. C. Mackey, Sco. Rif., and to be seconded ; 2nd Lieut. F. Egerton, 17th Lrs., and to be seconded ; Temporary Second Lieut. B. L. Dowling, A.S.C., and to be transferred to the General List ; 2nd Lieut. (on probation) A. W. Gilfillan, R. Fus., Special Reserve, and to be seconded ; 2nd Lieut. (on probation) J. D. Stodart, Special Reserve ; July 28th, 1916. Temporary 2nd Lieut. E. Bainbridge, General List ; Aug. 11th, 1916. 2nd Lieutenants, Special Reserve : M. H. Butler ; Aug. 16th, 1916. C. L. Milburn ; Aug. 19th, 1916. Aug. 21st, 1916 : Lieut. A. W. Ruthven-Stuart, Gord. Highrs. (T.F.) ; Temporary Lieut. H. W. Auster, Garr. Bn., Worc. R., and to be transferred to the General List ; Temporary 2nd Lieut. E. H. Hall, D. of Corn. L.I., and to be transferred to the General List ; 2nd Lieut. O. R. Knight, R.W. Surr. R. (T.F.). 2nd Lieutenants, Special Reserve : E. D. Clarke ; Aug. 22nd, 1916. Aug. 23rd, 1916 : E. E. Erlebach and H. A. Howell E. P. M. Shaw ; Aug. 24th, 1916. Aug. 25th, 1916 : 2nd Lieut. W. L. Birch, W. York R. (T.F.) ; Temporary 2nd Lieut. P. L. Lindup, General List. Aug. 26th, 1916 : Lieut. R. J. Elliott, 39th Canadian Inf. Bn. ; 2nd Lieut. S. G. Rome, Arg. and Suth'd Highrs., and to be seconded. Aug. 27th, 1916 : Temporary 2nd Lieut. V. F. H. Hugill, R. Fus., and to be transferred to the General List. 2nd Lieutenants, Special Reserve : W. C. Fenwick, M. Sharp, T. B. W. Spencer and N. B. Hair ; Aug. 28th, 1916.

Assistant Equipment Officers.—2nd Lieut. E. A. Mayner, Special Reserve ; Aug. 1st, 1916. 2nd Lieut. G. W. A. Brown, Special Reserve ; Aug. 14th, 1916. Aug. 21st, 1916 : Temporary 2nd Lieut. F. H. Cooke, Linc. R., and to be transferred to the General List ; Temporary 2nd Lieut. W. Scott, Notts and Derby R., and to be transferred to the General List ; 2nd Lieut., Special Reserve, F. W. Roberts ; Temporary 2nd Lieut. H. B. Dell, General List. 2nd Lieutenants, Special Reserve : S. M. Baber and A. W. Grigsby. Temporary 2nd Lieut. W. H. Gouldstone, General List ; Aug. 23rd, 1916. 2nd Lieut. J. Pearce, K.O. Sco. Bord., and to be seconded ; Aug. 25th, 1916. Sept. 1st, 1916 : Temporary Capt. H. E. A. Lindsay, General List ; Temporary Capt. W. Troup, General List.

Memoranda.—The date of appointment of Major B. R. W. Beor, R.A., as Temporary Lieutenant-Colonel is May 24th, 1916, and not as stated in the *Gazette* of July 10th, 1916, but without the pay and allowances of that rank prior to June 18th, 1916.

Second Lieutenants (on probation), from R.F.C., Special Reserve, to be Temporary 2nd Lieutenants on the General List, for duty with R.F.C., Aug. 24th, 1916 : R. H. Lownds, H. E. Ward.

Pte. C. K. Scott, from A.S.C., to be Temporary 2nd Lieutenant for duty with the R.F.C. ; Sept. 11th, 1916.

To be Temporary 2nd Lieutenants (on probation), for duty with R.F.C. : Aug. 5th, 1916 : W. H. Jones, from No. 6 Officer Cadet Bn. ; R. O. Purry, from No. 8 Officer Cadet Bn. Cadet A. I, Gilson, Cadet A. W. L. Nixon and Cadet J. A. Rossi.

Supplementary to Regular Corps.—2nd Lieutenants (on probation) confirmed in their rank : A. T. Croucher, H. B. Dresser, G. Ralston, N. B. Hair, G. A. Giles, E. E. Erlebach, C. H. Stokes, M. Sharpe, G. Mackrell, T. B. W. Spencer, E. P. M. Shaw, W. C. Fenwick, H. A. Howell, T. G. Holmes, C. L. Milburn, E. D. Clarke, M. H. Butler, H. H. W. Vowden, H. E. L. Pilbrow, T. Morrison, C. J. Kennedy, A. E. M. Jansen, R. M. Baird, E. A. Mayner, P. E. Jeffcock, T. Perkins, A. W. O'Q. Shire, N. Kemsley, H. J. Robinson, S. Hay, L. Stones, F. F. Woodyer, G. A. Lawlor, E. G. Herbert.

To be 2nd Lieutenants (on probation) : F. B. B. Shand ; Aug. 7th, 1916. A. H. Bates ; Aug. 28th, 1916. Count L. T. B. di Balme ; Sept. 18th, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 20th :—

Flight-Commander.—Capt. E. R. L. Corballis, R. Dub. Fus., from a Deputy Assistant Director at the War Office ; Aug. 12th, 1916, but with seniority from Nov. 28th, 1914.

Flying Officers.—Aug. 21st, 1916 : Temporary Lieut. H. B. Milling, Motor M.G.C., and to be transferred to the General List. 2nd Lieutenants, Special Reserve : T. G. Holmes, G. Mackrell, G. A. Giles. 2nd Lieut. (on probation) N. E. S. Simon, Special Reserve. 2nd Lieut. (Temporary Lieut.) N. MacL. Robertson, 3rd Lowland Brig., R.F.A. (T.F.) ; Aug. 23rd, 1916. Aug. 24th, 1916 : Lieut. (Temporary Capt.) J. Thorburn, Forth R.G.A. (T.F.) ; 2nd Lieut. (Temporary Lieut.) C. C. Durston, H.A.C. (T.F.) ; Temporary 2nd Lieut. J. H. Crutch, attd. R. Berks R., and to be transferred to the General List ; 2nd Lieut. C. H. Stokes, Special Reserve. 2nd Lieut. A. W. Saunders, R.F.A., Special Reserve ; Aug. 25th, 1916. Temporary 2nd Lieut. C. Thomas, R. Fus., and to be transferred to the General List ; Aug. 28th, 1916.

Assistant Equipment Officers.—Temporary 2nd Lieut. A. Latimor, General List ; June 24th, 1916. 2nd Lieutenants, Special Reserve, Aug. 11th, 1916 : G. Ralston and H. B. Dresser.

Supplementary to Regular Corps.—2nd Lieut. (on probation) L. G. Fraser resigns his commission ; Sept. 21st, 1916.

The following appeared in a supplement to the *London Gazette* issued on September 21st :—

Flight-Commanders.—2nd Lieut. (Temporary Lieut.) J. Y. McLean, Northumbrian Brig., R.F.A. (T.F.), from a Balloon Officer, and to be Temporary Captain whilst so employed ; Sept. 4th, 1916. From Flying Officers, and to be Temporary Captains whilst so employed : Lieut. V. S. Brown, Special Reserve ; Sept. 6th, 1916. 2nd Lieut. A. Ball, Notts and Derby R. (T.F.) ; Sept. 13th, 1916.

Flying Officers.—Temporary 2nd Lieut. H. D. Hamilton, General List; Aug. 16th, 1916. 2nd Lieut. A. T. Croucher, Special Reserve; Aug. 19th, 1916. Temporary Capt. O. H. Ormrod, R.F.A., and to be transferred to the General List; Aug. 21st, 1916. Aug. 22nd, 1916: Temporary 2nd Lieut. J. B. Graham, R. Fus., and to be transferred to the General List. Temporary 2nd Lieut. G. Hedderwick, 1st Res. Regt. of Cav., and to be transferred to the General List. Temporary 2nd Lieut. S. J. Steenekamp, R. Fus., and to be transferred to the General List. Temporary 2nd Lieut. N. Goudie, General List. Aug. 23rd, 1916: 2nd Lieut. (on probation) H. Thompson, Special Reserve; Capt. W. H. Anderson, Australian F.C.; Lieut. S. Woodrow, Australian F.C.; Temporary 2nd Lieut. J. G. Will, Leins. R., from a Flying Officer (Observer), with seniority from April 1st, 1916; 2nd Lieut. W. E. Kemp, R. Lanc. R., Special R., and to be seconded; 2nd Lieut. T. Perkins, Special Reserve; 2nd Lieut. A. E. M. Jansen, Special Reserve. Aug. 24th, 1916: Temporary 2nd Lieut. P. A. McGuinness, Northd. Fus., and to be transferred to the General List; 2nd Lieut. C. V. Kerpen, Northn. R., Special Reserve, and to be seconded; 2nd Lieut. S. Crosfield, Ches. R. (T.F.); Temporary 2nd Lieut. G. Edwards, General List; Lieut. E. E. Barnes, R.E., Special Reserve; 2nd Lieut. W. H. Dolphin, Ind. Army Res. of Off.; 2nd Lieut. F. F. Woodyer, Special Res.; Temporary 2nd Lieut. R. W. Chappell, General List; 2nd Lieut. C. J. Kennedy, Special Reserve. 2nd Lieut. S. Hay, Special Reserve; Aug. 26th, 1916.

Assistant Equipment Officers.—2nd Lieutenants, Special Reserve: Aug. 28th, 1916: P. B. Harris, R. M. Baird, P. E. Jeffcock, H. J. Robinson, A. W. O'Q. Shire, J. L. Andrew, A. S. F. Morris, A. W. Payne, D. W. Wilson. 2nd Lieut. (on probation) T. G. MacKenzie, Special Reserve. Temporary 2nd Lieut. W. F. Merritt, General List. 2nd Lieut J. N. Stephens, Special Reserve. 2nd Lieutenants (on probation), Special Reserve: L. G. P. Warren, A. C. Hartley; Sept. 1st, 1916.

Supplementary to Regular Corps.—2nd Lieutenants (on probation) confirmed in their rank: P. B. Harris, T. E. Gorman, C. C. Morley, L. G. Courage, E. B. W. Bartlett, O. C. Godfrey.

To be 2nd Lieutenants: J. L. Andrew; Aug. 3rd, 1916. L. Mantell; Aug. 13th, 1916. W. H. Farnell; Aug. 26th, 1916.

To be 2nd Lieutenants (on probation):—Aug. 21st, 1916: C. W. Barnsley, T. Woodman. A. E. Squire; Aug. 22nd, 1916. H. Lloyd; Aug. 25th, 1916. J. H. B. Foss; Aug. 27th, 1916.

The following appeared in the *London Gazette* of September 23rd:—

The date of appointment of temporary Lieut. A. T. Eason, Notts. and Derby R., as a Flying Officer is July 27th, 1916, and not as stated in the *Gazette* of August 3rd, 1916.

Flying Officers.—2nd Lieut. N. Kemlsey, Special Reserve, Aug. 9th, 1916. 2nd Lieutenants (on probation), Special Reserve: A. J. McWha. Aug. 16th, 1916: P. H. Smith. Aug. 19th, 1916: H. B. Burrell; Aug. 21st, 1916. Aug. 23rd, 1916: Temporary 2nd Lieut. S. A. Martindale, Middx. R., and to be transferred to the General List; 2nd Lieut. E. B. W. Bartlett, Special Reserve. Aug. 24th, 1916: 2nd Lieut. (temporary Lieutenant) C. E. V. Porter, Essex R., T.F.; 2nd Lieut. J. H. Dodgshon, Surr. Yeo., T.F. Aug. 27th, 1916: 2nd Lieut. (on probation) S. H. Pratt, R. Fus., and to be seconded; 2nd Lieut. M. S. Faraday, Home Counties Brig., R.F.A., T.F. Aug. 28th, 1916: 2nd Lieut. T. West, Kent Fortress Engrs., R.E., T.F.; Temporary 2nd Lieut. (on probation) E. T. C. Brandon, R. Suss. R., and to be transferred to the General List. Aug. 29th, 1916: 2nd Lieut. (temporary Lieutenant) J. McKelvie, Northumbrian Divl. Engrs., R.E., T.F., from a Flying Officer (Observer), with seniority from April 29th, 1916. 2nd Lieut. (temporary Lieutenant) R. C. Kean, S. Lanc. R., T.F.; 2nd Lieut. (on probation) A. G. Jarvis, Special Reserve.

Flying Officers (Observers).—Temporary 2nd Lieut. C. Murchie, General List. Sept. 1st, 1916: Temp. 2nd Lieut. L. Reynolds, North'd. Fus., and to be transferred to the General List. Sept. 2nd, 1916: Sept. 4th, 1916: Lieut. (temporary Captain) W. A. Fleming, Devon. R.; Temporary Lieut. C. G. Rushton, General List; Lieut. the Hon. R. G. Winn, C. Gds., and to be seconded; 2nd Lieut. A. N. Greg, R. War. R., T.F.; Temporary 2nd Lieut. F. Gartside-Tippinge, R.A., and to be transferred to the General List; Temporary 2nd Lieut. R. A. Preeston, N. Lan. R., and to be transferred to the General List; Temporary 2nd Lieut. C. J. Beatty, General List. Sept. 5th, 1916: Lieut. (temporary Captain) J. W. Pain, Suff. R., T.F.; Temp. 2nd Lieut. F. W. Day, R. Fus., and to be transferred to the General List. Sept. 7th, 1916: Temporary Capt. H. Wadlow, A.S.C., and to be transferred to the General List; Lieut. A. P. D. Hill, R.A., and to be seconded; Lieut. D. L. Macauley, 2nd Canadian Prov. Bn.; 2nd Lieut. W. B. Saint, R. Scots, T.F.; 2nd Lieut. G. N. Cousans, R. Innis. Fus. (since killed in action); 2nd Lieut. C. W. Busk, Suff. R., and to be seconded; Temporary 2nd Lieut. J. M. R. Langley, General List.

Adjutants.—2nd Lieut. R. S. Rumbold, Som. L.I., from May 31st to July 31st, 1916. Capt. J. F. Dyer, E. Lan. R., and to be seconded, vice Capt. C. Fraser, N. Staff. R. Aug. 9th, 1916. Temporary Lieut. W. T. Blake, General List, vice 2nd Lieut. (temporary Captain) R. S. Rumbold, Som. L.I. Aug. 13th, 1916. Temporary Capt. W. B. Hellard, General List, from a Balloon Officer. Sept. 6th, 1916.

Assistant Equipment Officers.—2nd Lieutenants (on probation), Special Reserve.—C. J. Pender, C. H. Vincent, F. H. Sanders, D. N. Keith, F. G. Seabrooke, R. T. Vernon, P. Young. Aug. 21st, 1916.

Memoranda.—The notification in the *Gazette* of Aug. 14th, 1916, relating to L.-Corpl. Reginald Noel Swann is cancelled. The notification in the *Gazette* of Aug. 29th, 1916, relating to the undermentioned is cancelled: Sergt. Arthur Sydney Talbot, Pte. Clive Russell Bray. The notification in the *Gazette* of Aug. 30th, 1916, relating to the undermentioned is cancelled: Pte. Herbert Cornelius Bourne, Gunner Clifford Bray King.

The following appeared in a supplement to the *London Gazette*, issued on Sept. 23rd:—

Squadron Commander.—2nd Lieut. (temporary Captain) W. A. Grattan Bellew, Conn. Rang., from a Flight Comdr., and to be temporary Major whilst so employed. Sept. 5th, 1916.

Equipment Officer.—Lieut. F. S. Creswell, Special Reserve, from an Assistant Equipment Officer, and to be temporary Captain whilst so employed. Sept. 1st, 1916.

Flying Officers.—2nd Lieut. (on probation) E. F. Nash, Special Reserve, Aug. 24th, 1916. Aug. 29th, 1916: Capt. J. Everidge, Surr. Yeo., T.F., from a Flying Officer (Observer), with seniority from May 1st, 1916; 2nd Lieut. E. G. Waters, Hamps. Yeo., T.F.; 2nd Lieut. D. H. de Burgh, R.A., from a Flying Officer (Observer), with seniority from April 1st, 1916; 2nd Lieut. H. Dewhirst, W. Rid. Brig., R.F.A., T.F.; 2nd Lieut. R. S. Aitken, E. Anglian R.G.A., T.F.; 2nd Lieut. O. C. Godfrey, Special Reserve; temporary 2nd Lieutenants, General List.—S. Smith, S. L. Pope, E. P. Charles; 2nd Lieut. L. G. Courage, Special Reserve; 2nd Lieut. (on probation) N. B. Lovemore, Special Reserve.

Assistant Equipment Officers.—2nd Lieutenants Special Reserve.—L. Mantell. Aug. 13th, 1916. W. H. Farnell. Sept. 9th, 1916.

Memorandum.—L.-Corpl. Robert F. McMichael, from Res. Bn., S. Afr. Inf., to be temporary 2nd Lieutenant for duty with the R.F.C. Aug. 14th, 1916.

Supplementary to Regular Corps.—2nd Lieut. (on probation) E. V. Tinham-Davenport resigns his commission. Sept. 24th, 1916.

Aeronautical Inspection Department.

THE following appeared in a supplement to the *London Gazette* issued on September 20th:—

K. Robertson to be Temporary Hon. Lieutenant (without Army pay and allowances) whilst employed in the Aeronautical Inspection Department; Sept. 21st, 1916.

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A Badge for 1st Class A.Ms., R.F.C.

AN Army Order, dated September 24th, announces that a distinguishing badge consisting of a "two-bladed propeller" has been approved for 1st Class Air Mechanics of the Royal Flying Corps. The badge for the greatcoat and service dress jacket will be of worsted embroidery, and, being a badge of appointment, will be worn horizontally above the elbow on the right arm only.

MORE REWARDS FOR THE R.F.C.

In a supplement to the *London Gazette*, issued on September 22nd, it was announced that His Majesty the King has been graciously pleased to approve of the appointments of the undermentioned Officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the field :—

Temporary 2nd Lieutenant Henry Cope Evans,
General List, attached R.F.C.

For conspicuous gallantry and skill on many occasions in attacking hostile aircraft, frequently against large odds. In one fortnight he brought down four enemy machines, returning on one occasion with his machine badly damaged.

Captain John Upton Kelly, Wilts. R. and R.F.C.

For conspicuous gallantry and skill on several occasions. When making a reconnaissance he came down to 700 feet under heavy fire, and obtained valuable information. Again, in attempting to observe through clouds, he flew over the enemy lines at 500 feet, and although severely wounded and almost blind, he brought his machine back to our lines.

Temp. Capt. Allister Mackintosh Miller, Cav., and R.F.C.

For conspicuous gallantry and skill when attacking troops on the ground under heavy fire. On one occasion he flew close to the ground along a line of hostile machine-guns, engaging them with his machine-gun, drawing their fire, and enabling the cavalry to advance. Again, when alone, he engaged five enemy machines, bringing one down, and also successfully bombed a troop train, coming down to 300 feet to make sure of hitting.

It was also announced that His Majesty the King has been graciously pleased to confer the Military Cross on the undermentioned Officers in recognition of their gallantry and devotion to duty in the field :—

2nd Lieut. Malcolm Glassford Begg, Rif. Bde. and R.F.C.

For conspicuous gallantry and skill in contact patrol work. A close reconnaissance was required of a certain locality, and he came down to 700 feet and obtained valuable information under a heavy fire from the ground.

Lieutenant. Charles Meredith Bouverie Chapman,
E. Kent R. and R.F.C.

For conspicuous gallantry and skill in action against hostile aeroplanes. On one occasion he attacked three L.V.G.s and one Fokker, shooting the latter down. Later, during an air battle with eleven enemy machines, he brought another Fokker down.

Lieut. William Eardley Harper, Dur. L.I., S.R. and R.F.C.

For conspicuous gallantry and skill in many aerial combats, and notably when, acting as Gunner Observer, his machine, with two others, met six hostile aeroplanes. He at once attacked and shot down one machine. He then attacked and drove down a second one. A thick fog came on and in landing his machine was wrecked, and he was badly cut and shaken. He managed to walk two miles to his aerodrome and to deliver his report before collapsing.

2nd Lieutenant Alexander Lindsay Macdonald,
R. Highrs. and R.F.C.

For conspicuous gallantry and skill when carrying out artillery and patrol work at low altitudes and under heavy fire. On one occasion he dispersed a large body of infantry by machine-gun fire from 1,200 feet, and then at once turned a battery on to another advancing battalion, causing many casualties.

2nd Lieut. Thomas Earle Gordon Scaife, Dn.Gds. and R.F.C.

For conspicuous gallantry and skill when on contact patrol work during active operations, often flying low under heavy fire. On one occasion, when flying at 1,000 feet, his petrol tanks were pierced by shell fire. He managed to stop the holes and enabled his pilot to bring the machine home.

2nd Lieut. Cuthbert William Short, R. of O., I.A. and R.F.C.

For conspicuous gallantry and skill. On one occasion, when our cavalry were held up by machine-gun fire, he, with Captain Miller as pilot, came close to the ground, and flew several times along the line of hostile machine-guns, drawing their fire and engaging them with his Lewis gun, thus enabling the cavalry to advance.

Temporary Captain Jacob Guy Swart, R.A. and R.F.C.

For conspicuous gallantry and skill in attacking troops on the ground from a low altitude, his machine being frequently subjected to very heavy machine-gun and rifle fire from the ground.

Capt. H. E. F. Wyncoll, Notts. and Derby. R. and R.F.C.

For conspicuous gallantry and skill as an observer, and in attacking troops on the ground from low altitudes. On one occasion, with Captain Swart as pilot, he successfully attacked three detachments of the enemy, his machine being subjected to heavy machine-gun and rifle fire from the ground.

The undermentioned Officer has been awarded a Bar to his Military Cross for subsequent acts of conspicuous bravery :—

Captain Leoline Jenkins, R.G.A. and R.F.C.

For conspicuous gallantry and skill. He has done much fine work for the artillery, often under very difficult circumstances. On one occasion he flew for a long time at a very low altitude under continual machine-gun and artillery fire. (The Military Cross was awarded in *London Gazette*, dated June 3rd, 1916.)

In a supplement to the *London Gazette* issued on September 26th it was announced that H.M. the King has been graciously pleased to approve of the appointment of the undermentioned officer to be a Companion of the Distinguished Service Order in recognition of his gallantry and devotion to duty in the field :—

Second Lieutenant (Temporary Lieutenant) Albert Ball,
M.C., Notts and Derby R. and R.F.C.

Observing seven enemy machines in formation, he immediately attacked one of them and shot it down at 15 yards' range. The remaining machines retired. Immediately afterwards, seeing five more hostile machines, he attacked one at about 10 yards' range and shot it down, flames coming out of the *fuselage*. He then attacked another of the machines which had been firing at him, and shot it down into a village, when it landed on the top of a house. He then went to the nearest aerodrome for more ammunition, and, returning, attacked three more machines, causing them to dive under control. Being then short of petrol he came home. His own machine was badly shot about in these fights.

The undermentioned has been awarded a Bar to his Distinguished Service Order for subsequent acts of conspicuous gallantry :—

Lieutenant Albert Ball, D.S.O., Notts and Derby R. and R.F.C.

When on escort duty to a bombing raid he saw four enemy machines in formation. He dived on to them and broke up their formation, and then shot down the nearest one, which fell on its nose. He came down to about 500 ft. to make certain it was wrecked. On another occasion, observing 12 enemy machines in formation, he dived in among them, and fired a drum into the nearest machine, which went down out of control. Several more hostile machines then approached, and he then fired three more drums at them, driving down another out of control. He then returned, crossing the lines at a low altitude, with his machine very much damaged. (The award of the Distinguished Service Order is also announced in the *Gazette* of this date.)

H.M. the King has been graciously pleased to confer the Military Cross on the undermentioned officers in recognition of their gallantry and devotion to duty in the field :—

Second Lieutenant Norman Brearley, L'pool. R., Special
Reserve and R.F.C.

He went out to attack an enemy kite-balloon, and managed to get immediately above his objective. He then pretended that he had been hit by anti-aircraft fire and side-slipped down to 1,500 ft., when he suddenly dived at the balloon, which was being hauled down, and fired into it until he almost touched it. When at 300 ft. from the ground the balloon burst into flames and was entirely destroyed. He then returned.

Temporary Captain Gerald Dixon-Spain, R. Fus.
and R.F.C.

Second Lieutenant Guy Patrick Spence Reid, Sea.
Highrs. and R.F.C.

Captain Dixon-Spain, with Second Lieutenant Reid as pilot, attacked and drove back a hostile machine. A few minutes later four hostile machines were seen, three of which were attacked, one after another, and driven back, the fourth being accounted for by another patrol. Another time they attacked two hostile machines, shot one down and drove the other back. Two days later they attacked two more machines, of which one is believed to have been destroyed, the other being pursued back to its aerodrome.

Lieutenant Ernest Dorland Hicks, Can. Force and R.F.C.

He brought down two enemy machines and attacked and drove back over their lines three others. On one occasion he came down to 800 ft. and bombed trains. On another he came down to 300 ft. and dropped bombs on a station.

THE "X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 47" Raid.

The following *communiqué* has been issued by the Field-Marshal Commanding-in-Chief, Home Forces :—

September 22nd, 4.50 p.m.

"A German seaplane appeared near Dover between 3.5 and 3.10 p.m. this afternoon. Anti-aircraft guns at once came into action, and several aeroplanes went up in pursuit of the raider, which at once made off in a north-easterly direction. Three bombs were dropped, but there were no casualties."

German Version.

Berlin, September 22nd.

"One of our aeroplanes, stationed in Flanders, dropped bombs on the military barracks near Dover."

"X 48" Raid.

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces :—

September 23rd, 11.55 p.m.

"A number of hostile airships visited the East and South-Eastern coasts to-night. Bombs have been dropped in various places and the raid is still in progress. No report of casualties or damage is yet to hand. A further *communiqué* will be issued in the morning."

September 24th, 2.50 a.m.

"An attack by hostile airships was made on Lincolnshire, the Eastern Counties, and on the outskirts of London. The latter attack was from the North-East and South-East about midnight and was beaten off by the anti-aircraft defences.

"One airship was brought down in flames in the southern part of Essex, and reports have been received that another fell on the Essex coast; the latter report is not yet confirmed. No reports of casualties or damage have yet been received."

12.15 p.m.

"Fourteen or fifteen airships participated in the attack on Great Britain last night. The South-Eastern, Eastern, East Midland Counties, and Lincolnshire were the principal localities visited. An attack on London was carried out by two airships from the South-East between 1 and 2 a.m., and by one airship from the East between 12 and 1 a.m. Aeroplanes were sent up and fire was opened from the anti-aircraft gun defences, the raiders being driven off. Bombs were dropped, however, in the Southern and South-Eastern districts, and it is regretted that 28 persons were killed and 99 injured.

"Two of the raiders were brought down in Essex. They were both large airships of a new pattern. One of the raiders fell in flames and was destroyed, together with the crew. The crew of 22 officers and men of the second were captured.

"Detailed reports of casualties and damage have not yet been received."

5.20 p.m.

"Latest reports show that probably not more than twelve airships participated in last night's air raid. Police reports from the Provinces indicate that the damage done by the raiding airships was slight. At one town in the East Midlands, however, a number of bombs were dropped, and it is regretted that two persons were killed and eleven injured. It is feared that two more bodies are buried under some ruins in this town. Some damage was caused at a railway station, and about a dozen houses and shops were wrecked or damaged, and a chapel and a storehouse were set on fire. With this exception no other casualties have been reported outside the Metropolitan area, and although a large number of bombs were dropped promiscuously over the districts visited by the airships the material damage is insignificant. A great number of bombs fell in the sea or in open places.

"In the Metropolitan area 17 men, 8 women, and 3 children were killed; 45 men, 37 women, and 17 children being injured. A considerable number of small dwelling-houses and shops were demolished or damaged; a number of fires were caused; two factories sustained injury; some empty railway trucks were destroyed, and the permanent way was slightly damaged in two places.

"No reports have been received of any military damage."

September 26th, 5.20 p.m.

"It has now been established that the two airships brought down in this raid were the naval Zeppelins 'L 32' and 'L 33.' Both were of very recent construction. The first airship was finally destroyed by an aeroplane after passing through effective gunfire. The second airship was hit by gunfire from the London Defences, and forced to descend in Essex through loss of gas.

"Owing to deaths from injuries having occurred and to casualties not having been reported to the police immediately, some amendment must be made to the list of casualties caused during the raid on the night of September 23rd–24th. Corrected figures are as follows :—Killed: 23, men, 12 women, 3 children; Total, 38. Injured: 56 men, 43 women, 26 children; total, 125."

German Version.

Berlin, September 25th.

"During the night of September 23rd several naval airships dropped bombs on London and places of military importance on the Humber, and in the Midland Counties, including Nottingham and Sheffield. The result was everywhere observed by big fires, which could be seen for a long time. On their way, before crossing the British coast, the airships were taken under fire by guard vessels, and during the attack itself under extraordinarily heavy fire with incendiary shells by numerous anti-aircraft batteries. They silenced some batteries by well-directed volleys.

"Two airships fell victims to the enemy anti-aircraft defences of London. All the others returned undamaged.—(Signed) Chief of the Admiralty Staff."

It is officially stated that, in addition to the fact that no anti-aircraft defences or places of military importance were damaged, the account is full of the usual misstatements.

"X 49" Raid.

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces :—

September 25th, 11.45 p.m.

"Several hostile airships crossed the East and North-East Coasts between 10.30 and midnight. Bombs are reported to have been dropped at several places between Northern and North-Midland Counties. An airship has also been reported off the South Coast. No reports of damage or casualties have been received."

September 26th, 3.15 a.m.

"Several hostile airships, probably six in number, visited the North-Eastern and Southern Counties during the night. Bombs were dropped in the Northern Counties, and some casualties and damage are reported. Full reports have not yet been received."

12.10 p.m.

"Seven airships carried out a raid on England last night and in the early hours of this morning. The districts attacked were the South Coast, East Coast, North-East Coast and North Midlands. The principal attack was aimed against the industrial centres in the last-mentioned area. Up to the present no damage to factories or work of military importance has been reported. It is reported, however, that a number of small houses and cottages were wrecked or damaged in some places, and 29 deaths have been reported.

"No attempt was made to approach London.

"The raiders were engaged by the anti-aircraft defences and were successfully driven off from several large industrial centres."

September 26th, 5.20 p.m.

"In the raid of last night the total casualties so far reported are: Killed, 36. Injured, 27.

"Very slight damage was caused, and none whatever of military importance."

* * *

German Airship Casualties.

A SECOND list of German Army airship losses gives (in addition to the one including the name of Captain Schramm) 17 names, 16 registered as missing and 1 died of sickness, says the *Daily Mail* correspondent at Amsterdam. The list includes 1 infantry captain, 2 lieutenants, 10 engineers, 2 helmsmen, 1 N.C.O., and 1 private.

RELICS OF THE CUFFLEY AIRSHIP EXHIBITED AT THE H.A.C. GROUNDS.

Judging from the length of the queue awaiting admission into the tent temporarily containing the remnants of the airship destroyed at Cuffley on September 3rd, the bringing down of two more airships this last week-end has given an extra impetus to the interest shown in the exhibition now held at the H.A.C. grounds, Finsbury, where large numbers of people have during the last few days availed themselves of the opportunity of inspecting at close quarters all that remains of the airship brought down by Lieut. Robinson, V.C.

Although severely "strafed" by the intense heat of the burning gas and the subsequent impact when striking the ground, much remains that is of interest. Of the framework little enough has survived, owing to the extensive use of wood in the construction, what there is of it being in the nature of subsidiary structures such as control mountings, engine beds, &c., rather than portions of the main framework. Of the latter, practically all there is to give an indication of the form of construction employed is a few central rings with cables attached, these evidently running out radially from the central ring to points on the periphery of the polygonal formers that carried the longitudinal girders. Of the outer fabric covering nothing remains, a few torn fragments coated with a somewhat thick layer of grey paint having probably come off one of the gondolas, as the thickness of paint on it would appear to be prohibitive to its employment on the entire envelope. A few pieces of what looks like oilskin appears to have formed part of one of the ballonets, but an insufficient quantity of this as well as of the main framework remains to be able to estimate with any degree of accuracy what were the number of ballonets or what the overall length of the airship. That she cannot have been a small one seems evident from the size of the four engines, which must have developed something like 250 h.p. each. The engines themselves are so unlike any of the German aero engines as we know them that it is difficult to say for certain of what make they are, and no name-plate is to be found on either of them which might have given a clue as to their identity. All four engines are of the vertical type, with six separate cylinders. In general appearance they are not unlike the 8-cylinder pre-war Mercedes engines, which had, however, their cylinders cast in pairs. There is no overhead cam-shaft as in the smaller Mercedes engines used on the German aeroplanes, but the large 8-cylinder Mercedes referred to above, which was, by the way, rated at 230–240 h.p., was also without overhead cam-shaft, the valves being operated by push rods and rockers. In the engines on view overhead valves are employed, three exhaust and two inlet valves to each cylinder, the inlet valves being operated through tappets and rockers from a cam-shaft situated on one side of the engine, while the exhaust valves are similarly operated from a cam-shaft on the opposite side of the engine. The water jackets are in the shape of a T, asbestos and rubber washers being inserted between adjoining cylinders to form a watertight joint. Clutches and reversing gears giving two speeds in each direction are fitted to all the engines, the propellers having evidently been used for checking the speed of the airship and for manœuvring. So far as it is possible to see, the propellers have been

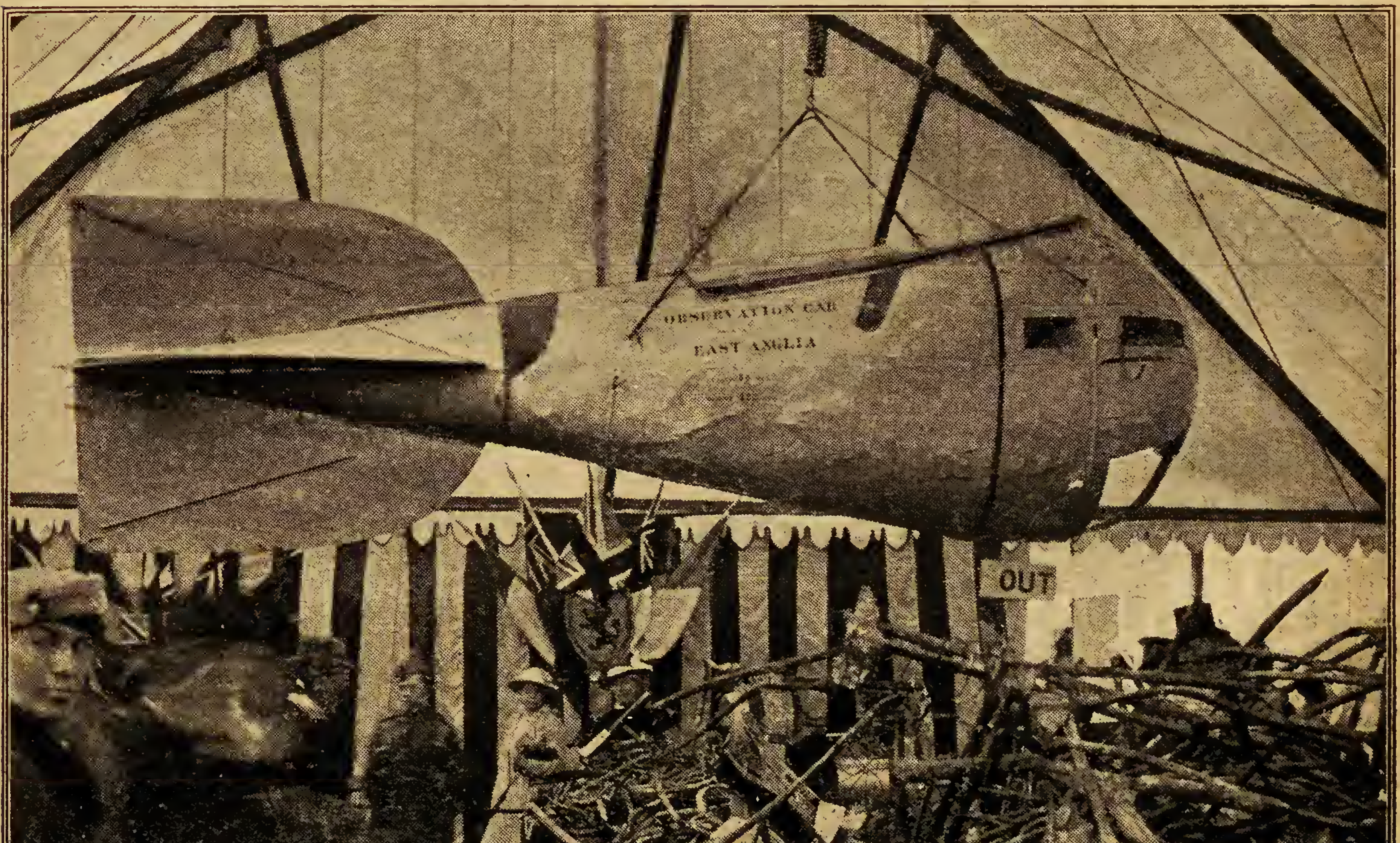


Photo. "Daily Mail."

THE ZEPPELIN RELICS.—The observation car found in East Anglia—and some of the miscellania on exhibit at the H.A.C. Headquarters, City Road.

placed concentrically with the engine shafts around a longitudinal axis, and have been carried on a tubular framework, a long, hollow shaft, some 4 ins. in diameter and about 5 ft. long, connecting the gear-box and the hub plates of the propellers.

These latter are of large size, having a diameter of about 20 ft., and a maximum blade width of about 1 ft. 6 ins. They are built up of 10 laminations of different kinds of wood, mostly walnut and mahogany, and have brass edgings on the outer portion of the blades. According to the stamps on the hub they were made by Lorentzen, of Bremerhafen.

Of other items of interest mention may be made of the electrical switchboard from which the releasing of the bombs is controlled. Pulling down a small switch, the knob of which is not unlike those ordinarily found on motor cars, closes a circuit which operates a small electromagnet, the armature of which actuates the release mechanism holding the bomb in place. When released the bomb slides down a bomb tube until clear of every obstacle. On one of the tables are seen some of the gas valves, consisting of two wood rings—a male and a female—held together by strong springs encased in the interior of pulleys, from which stranded cables pass to eye-bolts on the corresponding ring. In the way of armament there are to be seen several machine guns with cases of ammunition, the projectiles appearing to be unusually pointed.

Although not forming part of the same airship, the observation car picked up in East Anglia forms a very interesting exhibit. It is built up of a light framework of channel steel, covered with light gauge aluminium. It has a hemispherical nose, from which a conical tail projects backwards, the extreme point of the tail carrying vertical and horizontal fins, the object of which is obviously that of keeping the car head to wind when the airship is travelling at speed. Incidentally the method of suspension is interesting, and might be applied with advantage to the anchorage of kite balloons, since it is obvious that one may regard the observation car, hanging down by virtue of its weight and lagging behind the cruising airship on account of the resistance of the car itself and its cable, as equivalent to a kite balloon straining upwards on account of its lift and tending to drift back owing to the resistance of its envelope and anchor cable. The method of suspending the observation car consists of taking four short lengths of cable, attached with their inner ends to four points on the framework of the car, to one end of a coil spring, to the other end of which is attached the end of the single lift cable by means of which the car is suspended. Forming the core of this lift cable is a copper cable, serving evidently as a telephone wire, and the interior of the observation car bears evidence of having been fitted up with telephone, electric light, &c. A flat floor is built into the framework of the car, and on this the observer would lie stretched out flat, for making observations through the windows in the lower part and sides of the hemispherical nose-piece of the car, telephoning his observations to the commander of the airship. Owing to the resistance of the car and its cable it would, when the airship was under way, be some distance behind the airship, so that there would be little danger of the bombs dropped hitting the observation car. The means whereby the car was raised and lowered are evident from the windlass shot or dropped down with the car. That a man can in this manner be lowered a very considerable distance appears evident from the size of the drum on the windlass, which appears capable of holding several thousand feet of cable. On a cloudy night the advantages of being able to lower a man down below the clouds while keeping the airship above them would seem to be very considerable, and if used in connection with Vere lights the man in the car should get a rather good view of the ground below.

☞The expenses in connection with the exhibition are being borne by the Lord Mayor—Sir Charles Cheers Wakefield—who performed the opening ceremony on Monday. He said he was in communication with the authorities regarding the inclusion of some relics from the two airships wrecked in Essex. He hoped they might be able to have some on view towards the end of the week. On Tuesday over 70,000 people visited the exhibition.

ZEPPELINISMS.

Mr. Lloyd George, the Secretary for War, on his return to town on Monday, visited one of the areas where bombs were dropped.

A resident of an Essex village who saw the burning airship said to a representative of the *Daily Telegraph* :—

"It would be about half-past one when the airship was brought down. As I was watching it, it seemed to turn end up, and made a dive to the ground. It came down in four pieces, the first piece seemed about three times the size of the other pieces. A number of men in the vicinity burst into cheering when the airship fell. It took about 3 minutes for the monster to come to earth. The bodies of the airship crew were taken to a barn close by, which was turned into a mortuary."

Another eye-witness relates :—

"When the searchlights dropped on to the airship it suddenly turned round and travelled in a semi-circle. I saw it burst into flames, and when I got up on the scene a petrol tank riddled with shot was found in one field, and another tank was found some distance off in another field. The features of one young man recovered from the *débris* were quite recognisable, but most of the others were burned beyond recognition. One man, who was believed to be the commander, was found in an adjoining field. He was wearing an Iron Cross and his hand clasped field glasses. The local fire brigade came on the scene, but the fire was not extinguished until some two hours afterwards. The bodies were found in different parts of the meadow, and apparently some of the crew had jumped from the airship before the final crash.

"The airship burst into flames, which licked round it like the ignition of an incandescent mantle. It seemed to burn for about two minutes, gradually descending in an end-on position. It did not seem to burn quite so fiercely as the aircraft which was destroyed at Cuffley, but I believe the cause of this was that last night's victim contained more aluminium."

Most of those who visited the burnt airships missed seeing the tailplanes, which also fell about a mile away.

Two men have been arrested for selling aluminium relics.

"Business as usual" is on every shutter that has taken the place of a window, and the ordinary business of the shop goes on as if nothing had happened.

The main discomfort suffered by residents in private houses along the Zepp. route in the suburbs is due to the scarcity of glass.

One of the raiders which visited the southern suburbs of London dropped three lights, which burnt brilliantly for well over a minute.

Six bombs dropped in a Lincolnshire village only destroyed a fowlhouse and killed some chickens.

The airship brought down in flames is said to be the one which dropped her bombs on the suburbs.

The blazing airship was visible from a country town 60 miles away.

The captured crew all wore lifebelts.

The dead commander was wearing his Iron Cross.

The captured airship commander asked to be allowed to telephone to someone in London who would let his wife know he was safe.

Two women and two girls buried in the wreckage of their suburban house—completely smashed by a bomb—were extricated in their nightdresses, frightened but uninjured.

No inquest is to be held on the dead Zeppelin crew, the Coroner considering that no useful purpose can be served, the Essex County Police endorsing his action.

Fishermen arriving as Esbjerg on Monday reported having seen four airships going south-east; apparently they were short of fuel, and one, damaged at the back, was accompanied by destroyers.

Estimates of the time taken for the burning airship to fall vary from three to five minutes. The wreck burnt for two hours.

It is extraordinary how many empty houses were the billets for bombs.

One of the propellers of the burnt airship fell about a mile away from the main wreck.

During the excavations of one of the wrecked houses in a Northern town, in which all the occupants succumbed, a cat suddenly strolled from underneath an overturned harmonium.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to Sept. 19th, 1916	10,840	19	8
Staff and Workers of Gwynnes, Ltd. (Twenty-fourth contribution)	8	8	4
Collected at the Westland Aircraft Works, Yeovil (Forty-ninth contribution)	0	18	3
Collected at Ruston, Proctor, and Co. Aircraft Works (Eleventh contribution)	1	10	0
Total, September 27th, 1916 ..	10,851	16	3

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

THE ROLL OF HONOUR.

THE Secretary of the Admiralty announces the following casualties:—

Killed.

Flight-Lieut. J. T. Bankes-Price, R.N.

Slightly Injured.

Flight-Sub-Lieut. E. B. Thompson, R.N.

The following casualties have been officially announced by the War Office:—

Killed.

Second Lieut. C. J. Beatty, R.F.C.
Second Lieut. E. W. Burke, R. Fus., attd. R.F.C.
Lieut. C. E. N. Cooper, Lincoln Regt., attd. R.F.C.
Capt. F. G. Glenday, North'd. Fus., attd. R.F.C.
Capt. F. E. Goodrich, R.F.C.
7396 2nd Air-Mechanic R. Hobbs, R.F.C.
8215 2nd Air-Mechanic W. H. Wagner, R.F.C.

Previously reported Wounded, now reported Died.

13074 2nd Air-Mechanic J. T. Langton, R.F.C.
3836 Corpl. W. G. Moore, R.F.C.

Died of Wounds.

Lieut. G. G. Bentley, R. Warwick Regt., attd. R.F.C.
Second Lieut. P. J. Smyth, Connaught Rang., attd. R.F.C.
7750 2nd Air-Mechanic J. F. Pearce, R.F.C.

Wounded.

Capt. K. A. Brooke-Murray, A.S.C., attd. R.F.C.
Second Lieut. P. S. Butterworth, R.F.C.
Capt. H. A. Harris, R.A.M.C., attd. R.F.C.
Second Lieut. C. C. Hayward, R.F.C.
Second Lieut. C. S. Hollinghurst, R.F.C.
Second Lieut. G. W. Howland, R. Irish Regt. and R.F.C.
Second Lieut. D. L. Reed, Sherwood For., attd. R.F.C.
Lieut. R. Speirs, Cameronians (Sco. Rif.) and R.F.C.
Second Lieut. H. Tatton, Yeomanry and R.F.C.
Capt. G. Taylor-Loban, Durham L.I., attd. R.F.C.
Capt. E. J. Tyson, R.F.C.
21492 2nd Air-Mechanic W. S. Lumsden, R.F.C.

Missing.

Second Lieut. J. V. Bowring, S. Lancs. R., attd. R.F.C.
Second Lieut. F. H. Bowyer, Queen's (R.W. Surrey Regt.) and R.F.C.
Lieut. L. R. Briggs, Lond. Regt. and R.F.C.
Lieut. W. H. S. Chance, Worcester Regt. and R.F.C.
Capt. G. L. Cruikshank, D.S.O., Gordon Highrs. and R.F.C.
Second Lieut. D. Cushing, R.F.C.
Second Lieut. C. Elphinstone, R.F.C.
Second Lieut. G. B. J. Firbank, R.F.C.
Second Lieut. J. H. Gale, R.F.C.
Lieut. L. B. Helder, R. Fus., attd. R.F.C.
Sec. Lt. F. E. Hollingsworth, A. and S. Highrs. and R.F.C.
Second Lieut. C. J. Kennedy, R.F.C.
Lieut. G. Klingenstein, R.F.C.
Second Lieut. T. P. L. Molloy, Dorset Regt. attd. R.F.C.
Lieut. R. R. Money, E. Yorks. Regt., attd. R.F.C.
Second Lieut. L. B. F. Morris, Queen's (R.W. Surrey Regt.) attd. R.F.C.
Second Lieut. O. Nixon, Essex Regt., attd. R.F.C.
Second Lieut. A. F. A. Patterson, R.F.C.
Second Lieut. A. L. Pinkerton, R.F.A., attd. R.F.C.
Lieut. R. A. Preston, Lincoln R. and R.F.C.
Lieut. T. Rees, R. Welsh Fus., attd. R.F.C.
Second Lieut. W. B. Saint, R. Scots and R.F.C.
Lieut. J. W. Sanders, Middlesex Regt. and R.F.C.
Capt. A. S. M. Summers, Hussars and R.F.C.
Second Lieut. F. G. Thierry, R.F.C.
Second Lieut. H. Thompson, R.F.C.
Second Lieut. H. M. W. Wells, R. Berks. Regt. and R.F.C.
Second Lieut. R. Wood, W. Yorks Regt., attd. R.F.C.
Second Lieut. L. G. H. Vernon, R. Welsh Fus., attd. R.F.C.
13958 Corpl. W. Summers, R.F.C.

Previously reported Missing, now reported Prisoner of War.

3613 Sergt. H. Taylor, R.F.C.

Previously Unofficially, now Officially, reported Prisoners of War in German Hands.

Lieut. H. L. C. Aked, W. Yorks Regt. and R.F.C.
Lieut. E. R. Farmer, Yeomanry and R.F.C.

New Chief of the R A.F.

IT was announced on September 21st that Mr. Henry Fowler, A.M.I.C.E., M.I.Mech.E., M. Iron and Steel Institute, a Deputy Controller of Production at the Ministry of Munitions, had been appointed Superintendent of the Royal Aircraft Factory in succession to Lieut.-Col. Mervyn O'Gorman, C.B., who is now Consulting Engineer to the Director-General of Military Aeronautics. Mr. Fowler, previous to going to the Ministry of Munitions, was chief mechanical engineer of the Midland Railway. Although Mr. Henry Fowler has been associated with railways since he was apprenticed to the Lancashire and Yorkshire Railway in 1887, he has made a close study of internal combustion engines, in which subject he is a recognised authority. He was associated with the motor vehicle trials of the Liverpool Self-Propelled Traffic Association in 1898, 1899 and 1901, and has also done a great deal of honorary work in connection with the trials of the A.C.G.B.I., now the R.A.C. With the L. and Y. Railway Mr. Fowler rose to the position of Gas Engineer, when in 1900 he went to the Midland Railway. In 1904 he became assistant manager of the M.R. loco. works, in 1907 works manager, and in 1909 chief mechanical engineer.

Fatal Accidents.

LIEUT. D. C. BECK, R.F.A., attd. R.F.C., was killed on September 21st when landing to inquire his position. Apparently he had not slowed the machine sufficiently, and one of the wheels catching in a rut the machine turned over, pinning the pilot beneath. A verdict of "Accidental Death" was recorded at the inquest.

On the same day Lieut. W. H. Stuart Garnett, R.F.C., was killed at Upavon.

At an inquest on September 21st relative to the fatal accident to Lieut. H. M. Kendrick on September 18th, it was stated that the machine was in perfect order. The accident was probably caused by the machine striking the top of a tree. A verdict of "Accidental Death" was returned.

Lieut. Sidney Woodrow was killed near Birmingham on September 23rd. A police constable who saw the accident said the machine seemed to nose-dive from the clouds. The Coroner expressed the opinion that the deceased was seized with a fainting fit which caused him to lose consciousness. A verdict of "Accidental Death" was recorded.

Lieut. Percy Main, R.F.C., was also killed on Saturday while training.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to " FLIGHT *" about it.*

R. V. H. (Southampton).

It is impossible to say exactly what horse-power is required to propel a Zeppelin at a speed of 60 m.p.h., as this depends on the type and size. If we take it that the length of the Zeppelin is 680 ft. and its maximum diameter 67 ft., which figures would appear to tally very well with reports concerning Zeppelins of the latest type, an approximate estimate may be made of the resistance at 60 m.p.h. According to tests carried out at the R.A.F., a model of the D.B. Naval Airship No. 1, measuring 17 ft. in length and 1 ft. 7½ ins. diameter, offered a resistance of 0·31 lbs. at a velocity of 27 ft. per sec., or approximately 18·5 m.p.h. This model had conical ends and a cylindrical central portion. The total resistance of this model is stated to vary as $0{\cdot}00046V^{1{\cdot}98}$, or, in other words, the resistance varies less than as the square of the speed. Since, however, the Zeppelins are not of cylindrical but of polygonal section, and have moreover gondolas, tail planes, guns, &c., projecting outside the periphery of the polygon, we shall take it as sufficiently accurate for an approximate estimate that the resistance varies as the square of the speed. Besides, the modern Zeppelins do not appear to have a straight-sided centre portion, so that the resistance will probably be somewhat less on this account and help to make up for the resistance of the control planes, &c., the resistance on which might otherwise be somewhat in excess of the allowance made by raising the index of the velocity from 1·98 to 2.

The resistance of an airship 680 ft. long and having a maximum diameter of 67 ft., cruising at a speed of 60 m.p.h., is then found from the equation—

$$\frac{\text{Force on model (lbs.)}}{\text{Force on full size airship}} = \left(\frac{v}{40\ V}\right)^2$$

where v = velocity in m.p.h. at which model was tested, $\frac{1}{40}$ is the scale of the model and V = the velocity in miles per hour of the full size airship. We can therefore write $\frac{0{\cdot}31}{F} = \left(\frac{18{\cdot}5}{40 \times 60}\right)^2$, from which F = 5,230 lbs. approximately. As obviously the thrust must equal the resistance, we obtain the required horse-power from the formula $H = \frac{Tv}{550\ E_p}$, where T = thrust in lbs., v = speed of the airship in ft./sec., and E_p = the efficiency of the propellers, expressed as a decimal. Therefore the horse-power required, assuming a propeller efficiency of 75 per cent. $= H = \frac{5230 \times 87{\cdot}6}{550 \times {\cdot}75} = 1{,}110$ h.p. The Zeppelin airships of the latest type are said to be fitted with motors developing over 1,000 h.p., so that it appears reasonable to suppose that they can and do attain a speed of somewhere in the neighbourhood of 60 m.p.h.

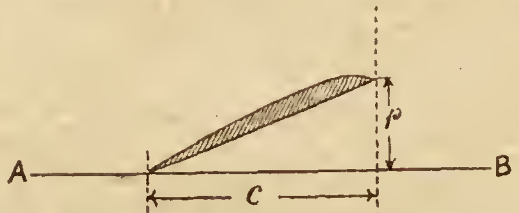
J. M. C. (Luton).

The reasons why a straight wing (one with no dihedral) possesses a certain amount of lateral stability when moving in a rectilinear path in still air can, perhaps, be best explained by a numerical example. Suppose, for instance, that the machine is travelling at a velocity of 100 ft./sec., and that by some force it is made to roll to such an extent that the wing tip moves downward a distance of 2 ft. in 1 sec. It will now be clear that the wing tip virtually has its angle of incidence increased, since it moves down a sloping path which represents the hypotenuse of a right-angled triangle, of which the other two sides are 2 ft. and 100 ft. respectively. For the case in question we may therefore write Tangent of angle $= \frac{2}{100} \doteq 0{\cdot}02$. Angle corresponding to an $\tilde{0}{\cdot}02$ = 1·8° approximately. The dropping wing tip therefore has its angle of incidence increased by 1·8° while the opposite wing tip has, of course, its angle of attack similarly decreased. As for small angles of attack the lift is proportional to the angle of incidence, it will be seen that a couple is set up, which tends to prevent rolling of the aeroplane.

E. S. (Sleaford) writes :—In the "Answers to Correspondents" page of "FLIGHT" of Septemebr 14th, an inquirer—H. C. B. (King's Lynn)—appears to have asked if it is possible to loop with the undercarriage pointing towards the centre of the circle. I quite believe (but would not be certain) I have seen loops made as above described. Perhaps some other reader living in this district will be able to say whether the above is correct or not."

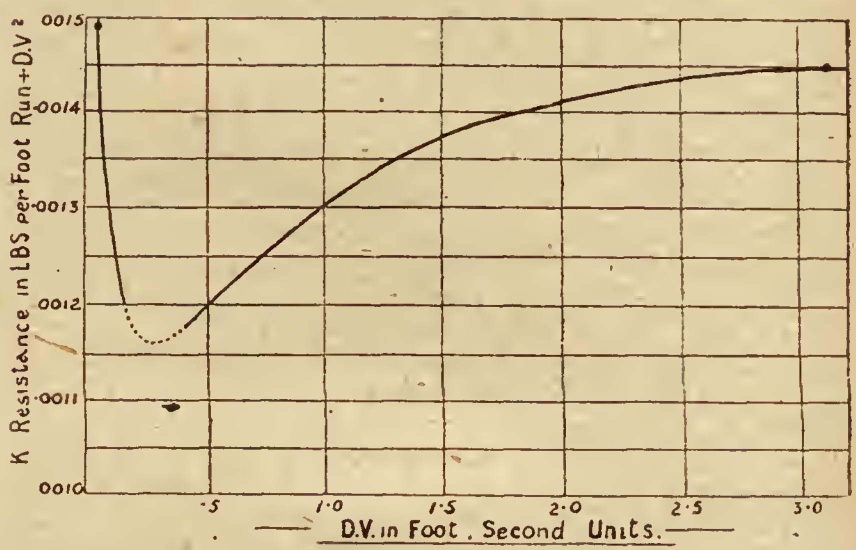
F. W. D. (Abingdon).

The pitch of an airscrew can be found in the following manner : Place the airscrew on a plane surface such as a table top, with the driving face downwards. The distance c, or the projected width of the blade, is a part of the circumference at the point measured, and the height p of the leading edge of the section above the base line is part of the pitch. The pitch is then found by the formula $P = \frac{2\ \pi r p}{c}$, where P = pitch, in inches, r = the distance from the axis of the propeller to the point measured, in inches, p = part pitch in inches, and c = part of circumference in inches.



A. M. R. (Manchester).

The resistance of smooth wires is expressed by the equation $F = KDV^2$, where F = force per unit length of the wire, D = diameter of the wire in feet, and V = velocity of the wind in ft./sec. K is not a constant, however, but a function of (DV). The accompanying graph taken from the annual report of the Advisory Committee for Aeronautics, 1912–13, gives the various values of K corresponding to various values of the product DV. To take an example : If it is desired to find the resistance per foot run of a wire 0·1 in. dia. at a speed of 100 m.p.h., or 146 ft./sec., D = 0·1 in. = 0·0083 ft., V = 146 ft./sec. ∴ DV = 0·0083 × 146 = 1·2. From the graph it will be seen that the value of K corresponding to a value of DV of 1·2 is about 0·00133. The resistance per foot run at 100 m.p.h. is therefore $= 0{\cdot}00133 \times 0{\cdot}0083 \times (146)^2 = 0{\cdot}235$ lbs.



C. D. (Southport).

We think you are in error as to the make of "dope" which has caused the symptoms you mention. For counteracting the effect of dope fumes a useful prescription is Ac. Pot. Tart, 10 drams ; Glusidum, 10 grains ; Soluble Essence of Lemon, 30 drops ; Aq. (water), 200 ozs. A small glassful should be taken occasionally as a drink.

R. F. C. (Whalley).

There is no actual weight limit for pilots, but other things being equal the lighter the better. We do not know of any chart such as you inquire for.

H. B. M. (Lincoln).

If you were given a commission, the Government would arrange for your tuition. As to whether you could get a transfer depends upon the view taken by your commanding officer, through whom your application must go.

R. M. W. (Manchester) ; X. Y. Z. (Woolwich).

You can obtain the necessary application forms from the Secretary to the Admiralty, Whitehall, S.W. There is no such grading at "Pilot." If you are accepted as a "Probationary Flight Officer," the Admiralty will arrange for your tuition.

AIRISMS FROM THE FOUR WINDS.

RECENT contributions received by the Lord Mayor towards the Kitchener Memorial Fund, which is well past the £300,000 mark, include £250 from the Coventry Ordnance Works, £100 from the Duke of Westminster; £41 14*s.* from the officers, N.C.Os. and men of a Squadron, R.F.C., per Major E. N. Gossage; £23 9*s.* 6*d.* from the officers, N.C.Os. and men of a Squadron, R.F.C., per Captain J. A. Cunningham.

- - -

WHY the lady-drivers attached to the R.F.C. headquarters should be called "Flying Women" is not quite clear. This is a ha'penny paper airism.

- - -

ANYWAY they look smart in their khaki uniforms, and the Royal Flying Corps badge on their sleeves gives quite a military touch.

- - -

THE New York Flying Yacht Club was recently opened with an aviation luncheon to which several of the guests flew on their flying boats.

- - -

SIR CHARLES CHEERS WAKEFIELD has announced to the Court of Aldermen that his decision not to allow himself to be nominated as Lord Mayor of London for a second year of office, must be regarded as final.

- - -

THE policeman who "arrested" the captain and crew of the derelict Zepp. obtained promotion and an Order of Merit—presumably local.

- - -

How about the "Special" who took the job on first?

- - -

WHAT was the matter with letting the Zepp. commander telephone his "friend," up to the point of giving the 'phone number? The latter scent *might* have proved worthy of being followed up.

- - -

NOT much merit in closing the door too quickly upon such possibilities.

- - -

To commandeer premises, goods, chattels and what not from private citizens in the name of the King for the direct purposes of benefiting the National cause, and then to refuse all redress and bandy words as to payment or compensation being "by act of grace," seems to ordinary folk as if such an act in these days of the twentieth century might well be associated with "dis" as a preface.

- - -

WE wonder how the R.F.C. folk like the "ramp" in the King's name.

- - -

QUITE a happy summary for a preliminary basis of Peace appears to have been gotten together by the *Cologne Gazette*. True, it is supposed to have been compiled from British sources, but it should nevertheless act as a decent sort of tonic upon the flagging subscriptions to the new German War Loan. There are a few minor points left out of the terms, such as, by way of instance, the re-arrangement of the ownership of one-time German Colonial possessions; but, subject to such additions as may be found expedient by the Allies, we are not inclined to quarrel with the summary taken broadly. The *résumé* includes the following:—

"An English Bishop proposes a Criminal Court composed of neutrals—presumably with Herr Wilson as president—and its condemnation would simply be enforced by the armed power of the Entente States. The Entente is at one in the decision not to negotiate either with the Kaiser or Herr von Bethmann-Hollweg. Herr Asquith has himself officially proclaimed that he will take his vengeance on the Kaiser personally. Almost everywhere one meets the pleasant intention to level Berlin to the ground, to destroy our industrial centres, to burn our warships—curiously enough we are still to be left a little army—and to divide up our mercantile marine among the band of robbers. But the main thing is to impose upon us a war indemnity, which Herr Crammond—who is secretary of the Liverpool Exchange, and therefore understands figures—reckons at only £8,600,000,000. Until payment is made the thumbscrew is to be applied until we are black in the face. An army of occupation, consisting doubtless of Zulus, Cingalese or even white Englishmen, is to remain in the country to eat everything up, and meanwhile the

WHERE A NUMBER OF THE GERMAN SOLDIERS ARE BURIED AT DOUAI.—Some of the Kaiser's men examining the headstones over the graves, particularly the one with the aeroplane propeller, which indicates the spot where the last remains of a German air pilot rest.

starvation blockade is to continue, so that we may not fall back into our old life of luxury. How long is it to last? Herr Maeterlinck, the poet whom we used to fête, tells us. 'Happily,' he says, 'the Germans are an industrious people, and we will compel them for 80 or perhaps 100 years to work for us. The Germans will be the slaves of Europe.'"

* * *

"THE Three Stinsons, in their marvellous triple looping display," may be one of the stunts in America soon, for the Sisters Stinson—Katherine and Marjorie—have now been joined in their looping exhibitions by their brother, Eddie.

* * *

BROTHER STINSON bids fair to become as skilled in aerial gymnastics as his sisters, judging from the feats he has been accomplishing recently on his tractor biplane.

* * *

THIS latter machine, by the way, is a speedy little machine designed by and constructed under the supervision of our old friend, Walter L. Brock. It follows European practice very closely, and is equipped with a 50 h.p. Gnome.

* * *

C. H. STEVENS, who, with H. Sykes as instructor, has been learning to fly the Martinsyde biplane, took an excellent "ticket" the other evening at Hendon. His distances from the "bull's-eye" were 29 and 19 yards respectively—not so bad for 4½ hours' tuition on a fast tractor 'bus. Stevens celebrated the event a couple of days later by taking his wife for an aerial trip on the Martinsyde around over the surrounding country!

* * *

AND all this after a nasty aeroplane smash some time back which resulted in serious injury to his legs.

* * *

HIS MAJESTY THE KING saw the Royal Flying Corps defeat the Rest of Aldershot Command at football at Aldershot on Saturday.

* * *

IT must be a grim—not to say ghoulish—kind of humour which prompts a Surveyor of Taxes to claim for excess profits duty on a municipal cemetery. Enough to make the tenants turn in their graves. But it would appear that Kensington was able to successfully resist the super-tax, as the borough treasurer demonstrated that the "profits" only gave a return of 2·23 per cent. on the capital invested and Parliament allowed 6 per cent.

* * *

WHICH CREW?

"ZEPPELIN. We crew."—The commander of the derelict airship to the constable who "arrested" the raiders.

'Twas English, Hans,
But was it true?
Foiled in your plans,
You cursed; WE crew.
(From the "Office Window," *Daily Chronicle.*)

* * *

To be able to run on an artificial leg is somewhat of an achievement. Yet there can be no doubt any longer that it is possible, as demonstrated by Marcel Desoutter some time ago. It should be pointed out that the leg was made by Desoutter himself, and embodied several new improvements.

S. Daucourt, the aviator who last week flew to Essen and "distributed" some bombs over Krupp's works.

DESOUTTER'S methods are very thorough in getting the data for constructing artificial limbs. For this purpose he has called into use the cinematograph and obtained pictures at a rate very much above that normally employed. These show, when projected at the ordinary speed, the movements of men at a very slow rate, which enables him to follow to the minutest details what takes place during every movement of progression. The action of all the different muscles and joints are studied in this manner, and the result is, as already mentioned, that he has produced an artificial leg on which it is not only possible, but comparatively easy, to run.

* * *

THAT Desoutter's success is in no small measure due to the fact that he is himself minus one of his legs since his unfortunate accident some years ago, goes without saying, since he is able to test for himself any new improvement and so find out where "the shoe pinches." That in itself is, of course, a great asset, but it is doubtful even then if he would have been able to find the best mechanical solution of the problem of imitating nature's engineering methods had he not also been a clever *mechanicien.* It should be mentioned that his brothers, who are also of a mechanical turn of mind, have been of great assistance to him.

* * *

MR. F. P. RAYNHAM, the well-known Brooklands pilot, is at present in a northern latitude on a special mission. During his absence the testing of Martinsyde machines is in particularly good hands, Mr. H. Barnwell, of Vickers, acting as *locum tenens.*

* * *

To state at present the output of an aeroplane factory would be to court certain disaster in the form of irate censors, enforcement of punishment for breach of the regulations laid down in the Defence of the Realm Act, &c., but at the risk of being shot daily at the Tower for a fortnight we are telling our readers that the output of the Blériot works is one machine per month for every 10 employees, counting women workers and boys; and taking these at ——, the output is ——, which is, we think, somewhat of a record. So now you know. Anyway, the Blériot works have not grown *very* much smaller lately. That's all right. We know it is an Irishism, but it's an Airism of counterweight.

BUT there is already a new large factory building "somewhere in England," and when this is completed the output per 10 men will probably be exceeded, and the total output very greatly increased accordingly. Under present conditions the result already achieved is one of much credit to Mr. Chereau, the general manager, and Mr. Davidson, the works manager.

* * *

THE POINT OF VIEW.—The East Coast householder took his last look out at the night before retiring. Black masses of angry cloud were scudding across the moonlit sky. On the horizon a Scotch elm, plainly silhouetted, bent almost double under the fury of the gale. From a tree in his own garden a branch had been torn off, and carried halfway across the lawn. Part of the garden fence had been blown down, and under each fresh onslaught of the gathering gale the rest groaned as if in anticipation of sharing its fate. In the house itself every door and window rattled.

He turned in with a sigh of content.

"Another peaceful night, thank goodness," he said to himself.

* * *

A WASTED LIFE.—KAISER (*to Count Zeppelin*): "Tell me, Count, why didn't you invent something useful, like the 'Tanks'?"—*Punch.*

* * *

CLAYBURY ASYLUM stands on one of the highest points in Essex, therefore it was, of course, just the very spot to have a bonfire 8 ft. high burning on the night of the record raid. The dear old fire-tender, with the usual dray-horse intelligence of pulling whilst there is anything about to pull, pleaded that the fire had been burning the whole 15 years he had been there, and got fined £5. The Phil May "Come inside" would fit like a glove, but it ought not to apply to the gardener. Orders are orders, and the man seems to have suffered through the lack of them as much as through the lack of common sense in his own cranium.

* * *

SINCE then the fire has been put out, and instructions given that it should not be lit again. If somebody again forgets to issue orders for its relighting when the war is over, It may grow through the coming years until it assumes colossal proportions. Then—perhaps 15 years the other way—somebody will suddenly realise that it ought to be set on fire, and things will resume the normal again. Wonderful.

◆ ◆ ◆

OWLS are the latest to join the ranks of animals that object to Zepp. raids. A pair of tawny boys of that ilk, a correspondent to a London newspaper says, are in a tree near his house, and when Zepps. are about they use language like that of a skipper chased by a Hun submarine. Wonder what it is like ?

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT'S" *precursor and sister Journal) of September 22nd,* 1906. "FLIGHT" *was founded in* 1908.

M. SANTOS DUMONT ACTUALLY FLIES.

On the 13th instant, M. Santos Dumont's aeroplane actually raised itself from the ground in virtue of its own proper velocity and made a flight, short it is true (the flight being only some seven or eight metres in length), but still an actual free flight through the air. As usual, M. Dumont was out early on this occasion, and at ten minutes to eight he started his motor and ran the aeroplane down the field at Bagatelle, the propeller, however, only revolving at about 900 r.p.m., the consequence being that the lifting force was insufficient, and the aeroplane was brought back again to the starting point. At 8.40, M. Santos Dumont started again, this time with the propeller revolving at some 1,000 r.p.m., and the machine attaining on its three wheels an estimated velocity of about 40 kilometres per hour. The aeroplane advanced at this speed across the field for about 100 metres, when M. Dumont tipped the tail of the machine so as to raise it in the air, and immediately the two front wheels rose about 2 metres, the rear wheel finally also leaving the ground. It was an interesting moment ; the first time in fact, as far as we are at present aware, that actual mechanical free flight has been accomplished in Europe. The aeroplane sank again towards the ground, on which it landed with something of a shock, the propeller being damaged, the propeller-shaft bent, the bamboo framework broken, and altogether the machine practically smashed up. M. Santos Dumont is at once starting to rebuild the machine, and the new design will involve the raising of the propeller.

M. ARCHDEACON'S BICYCLE EXPERIMENTS.

M. Archdeacon has been experimenting with the tractive effect to be obtained on an ordinary 6 h.p. motor bicycle by means of an aerial propeller, or, to be more correct, tractor, mounted in front. The total weight of the bicycle is 70 kilogrammes, and when ridden by Anzani, the well-known motor bicyclist, the total weight of rider and machine amounted to 150 kilogrammes. After starting up the engine, the bicycle was found to glide away very regularly and smoothly as soon as the propeller was thrown into gear, and ultimately the machine developed a speed of 79·3 kilometres per hour. M. Archdeacon is so satisfied with this result, that he is proceeding to apply the same engine and propeller to an aeroplane.

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FROM THE BRITISH FLYING GROUNDS

Grahame-White School, Hendon.

STRAIGHTS with instructor last week : Messrs. Kaiger, Norris and Whiteman. Circuits : Messrs. Cockell, Culver, Edwards, Fisher, Green, Hodgkinson, Lord, Munro, Payne, Ranson, Robertson, Rogers, Saunders, Steves, Styles, Sutherland, Travers, Woods and Zambournis.

Instructors : Messrs. Manton, Winter, Biard and Pashley.

Hall School, Hendon.

PUPILS out last week :—With Stanley G. Cownie : Messrs. Blake, Heathcote, Pugh, Foster, Course and Yuill. With Cecil M. Hill : Messrs. Dutton, Cowell, Packman and Lieut. Malden. With Gerald Smith : Messrs. Lambert, Barton and Bateman. With Fred J. Glegg : Messrs. Mayer, Smith, Maude, Foster, Blake, Yuill, and Pugh. Messrs. Smith and Bateman moved on to S. Smith.

Hall Government type tractors in use.

Bournemouth School.

PUPILS rolling alone last week : Messrs. Ross and Allen. Straights alone : Mr. Burry. Half-circuits alone : Messrs. Davies and Montgomery Holland. Figures of eight and circuits alone : Messrs. Brandon, Constant, Owen, and Montgomery.

Instructors Messrs. S. Summerfield and E. Brynildsen.

35, 45 and 60 h.p. Caudrons in use.

Certificates taken by Messrs. Brandon, Constant and Owen.

◆ ◆ ◆ ◆

Tribute from the Enemy.

THE following tribute to the air supremacy of the English and French on the Western front is contained in a telegram from German Headquarters to the *Frankfurter Zeitung* :—

"The severe rainy weather which began last night permits the expectation of some relief by impeding the very harassing air activity of the English and French."

German Seaplane Sunk.

A DANISH fishing cutter, the "Nordlyset," which arrived on September 21st, at Esbjerg—having been missing for some days—reported, according to the *Berlingske Tidende*, that a German aeroplane was wrecked at the Dogger Bank three days previously. Attempts were made by the crew of the cutter to rescue the two aviators, but owing to the heavy sea they failed, and the aeroplane was totally wrecked and the two men drowned.

Another Apostle of Frightfulness.

"IT is against England that our principal efforts must be directed. Every Zeppelin that drops destruction on London is an instrument of righteousness. England must be attacked more and more from the air, since our glorious armies which annihilate all other enemies cannot reach the shores of our most dangerous foe." Thus the King of Wurtemberg at a dinner at Stuttgart a few days ago.

Lieutenant Noel's Return to Salonica.

MR. G. WARD PRICE, writing from Salonica, on September 22nd, gives some further details of Sub-Lieut. Noel's flight from Salonica to Bucharest. He says :—

"Lieut. Noel, the French airman of Hendon, who made a flight to Bucharest and back, was decorated by General Sarrail with the Legion of Honour to-day. He flew from Salonica to Bucharest in five hours, and did the return journey in five and a half hours. The flight back was made in a storm, with clouds hanging round the mountain-tops.

"'Between Sofia and Salonica I thought I was done in,' said Noel, who speaks colloquial English perfectly. 'My engine nearly stopped with water in the carburettor from the clouds. I was too far off to reach our lines, so the only thing was to dive through the clouds in the hope of striking a possible landing-place, though this chance was small. I made an almost vertical volplane through the only hole in the clouds I saw. It brought me within 200 ft. of the side of the valley on which was a company of Bulgarian soldiers. They were terrified by this sudden swoop of an aeroplane out of the mists so close above them and bolted in all directions. Luckily, as I dived into the valley, my motor re-started, and I reached Salonica with hardly a single drop of petrol in the reservoir.'"

Personals

Casualties.

Second Lieutenant **Edward William Burke**, Royal Fusiliers, attached R.F.C., reported killed, was the only son of Mr. and Mrs. William C. Burke, of Cloonee, Ballinrobe, co. Mayo.

Second Lieutenant **Guy N. Cousans**, Royal Inniskilling Fusiliers attached R.F.C., who was killed on September 19th, was the only son of the late H. E. Cousans, and stepson of Mrs. Cousans, of Kimbolton House, Huntingdon.

Captain **Ferdinand Goncalves (Jack) Glenday**, Northumberland Fusiliers, attached R.F.C., who has been killed, was the fourth son of the late Mr. Alexander Glenday, of Brighton, and nephew of the Rev. E. A. Glenday, Vicar of Holy Trinity, Bury, with whom he resided after the death of his father. Captain Glenday was educated at Brighton College and St. Bede's Schools, and afterwards at Keble College, Oxford, taking his degree in 1914, with honours in modern history. He volunteered at the outbreak of the war. Captain Glenday, who had previously been wounded, was 24 years of age.

Lieutenant **Hamish Strathy Mackay**, R.G.A., attached R.F.C., whose death was mentioned last week, was killed in an aerial combat on September 9th. He was educated at Routtenburn and Sedbergh, and before the war was qualifying as a practical engineer. He was gazetted to the Royal Garrison Artillery as second lieutenant in August, 1914, and was attached to the R.F.C. on February 10th, 1916, proceeding to the front the following month.

Lieutenant **Francis Campion Mulcahy-Morgan**, Royal Irish Rifles, killed, was the fourth son of Mr. Edward S. Mulcahy-Morgan, Lara House, Rathdrum, co. Wicklow, and a brother of Captain E. S. Mulcahy-Morgan, Royal Irish Rifles, and Captain T. W. Malcahy-Morgan, Royal Irish Fusiliers and R.F.C.

Second Lieutenant **Dillwyn Parrish Starr**, Coldstream Guards, killed on September 15th, was the second son of Louis Starr, M.D., LL.D., and Mrs. Starr, of Philadelphia. He was born in 1884, and educated at Groton School and at Harvard, where he was conspicuous as an athlete, playing for four years in the University football team. At the outbreak of war he volunteered for service with the American Volunteer Motor Ambulance Corps, and for several months drove an ambulance for that unit, then attached to the Second French Army. In December, 1914, he enlisted as a petty officer in the Armoured Motor Car Service, R.N.A.S., and served with the Duke of Westminster's squadron in France, taking part in the battle of Neuve Chapelle. In May, 1915, he was recommended for a commission in the same service, and was gazetted sub-lieutenant. Soon afterwards he was sent to Gallipoli, where he served with distinction in the trenches at Suvla Bay as a machine-gun officer. In December, 1915, he returned to England, and was given a commission in the Coldstream Guards. He joined the Expeditionary Force last July.

Lieutenant **G. Greenwood Bentley**, R. Warwicks and R.F.C., whose death took place on September 17th, as the result of an accident, when landing in France, had only been out at the front there six weeks. He was the son of Mr. J. F. Bentley, of Whitstable.

Lieutenant **W. H. Stuart Garnett**, who was killed at the Central Flying School on September 21st, was the second son of Dr. and Mrs. William Garnett, of the Chestnuts, Hampstead. He was educated at St. Paul's School and Trinity College, Cambridge; he was a major scholar of Trinity, a ninth wrangler in his second year (1902), and in the following year he was placed in the First Class of the Mechanical Science Tripos. He also won the Wrangham Medal. Although he has died at the age of 34, he had lived a full and varied life. In 1903 he went to Wallsend-on-Tyne, where the Hon. Sir Charles Parsons was perfecting his marine turbine, on which Mr. Garnett wrote a book, which ran through several editions. He then decided to read for the Bar. After being called at the Inner Temple in 1905, he practised for some time, travelling the Western Circuit, and for a period he was a master at Eton. Later on he became interested in the national insurance scheme, on which he wrote a book in association with Mr. Arthur Comyns Carr. Subsequently Mr. Garnett abandoned his practice on his appointment as assistant legal adviser to the National Insurance Commission. An enthusiastic Alpine climber and an ardent yachtsman, he took a keen interest in the Boy Scout movement, being particularly active in promoting sea scouting, on which he wrote a book, which has had a wide circulation. In order the better to devote himself to work among boys, for whom he had founded a club at Shadwell, he lived for some years—and down to the outbreak of war—in a workman's flat at Limehouse, in which district the news of his death will be received with the deepest regret. In two successive years he won the Caymore Cup of the Royal Cruising Club. When war broke out, Mr. Garnett obtained the loan of a yacht, which he manned, both as to officers and men, mainly with Cambridge graduates and undergraduates, with a sprinkling of Sea Scouts. It was afterwards engaged in the mine-sweeping service. In the summer of last year, Mr. Garnett, who had attained the rank of lieutenant-commander, relinquished his naval duties in order to join the R.F.C. He acted as an observer for several months in France, where his inventive genius had effective play, with the result that he was recalled to this country and joined the experimental staff of the Central Flying School at Upavon. Early in the present year he qualified as pilot. Lieutenant Garnett married in August of last year Sybil, the only daughter of Mr. and Mrs. Bradley, of Streetley, Warwickshire. Dr. and Mrs. Garnett are at a base hospital in France with their youngest son, who was dangerously wounded about three weeks ago.

Lieutenant **Percy Main**, R.F.C., killed while flying on Saturday, was a Portsmouth man. He joined the R.F.C. for clerical duties, and later obtained a commission in the Hampshire Regiment. A month ago he rejoined the Flying Corps, and was completing a course when he was accidentally killed.

Married and to be Married.

An engagement is announced between Flight-Sub-Lieutenant **Norman E. Woods**, R.N.A.S., younger son of Mr. William E. Woods, of Rangiora, Arthur Road, Wimbledon Park, and Sydney, and **Florence Innes**, youngest daughter of H. I. **Perkins**, I.S.O., F.R.G.S., F.G.S., Surveyor-General, British Honduras, and Mrs. **Perkins**, of Wimbledon Park, and granddaughter of Major-General Edward Norman Perkins, Bengal Staff Corps.

Last week at Christ Church, Lancaster Gate, Captain (Temporary Major) **Arthur Edward Maitland**, Essex Regt., elder son of Mr. A. W. Maitland, of Cricklewood, Canterbury, was married to Miss **Dorothy Margaret Polson**, only daughter of the late Mr. Daniel Maclean Polson and of Mrs. Polson, of Invervar, North Berwick.

R.N.A.S. Raids.

The following was issued by the Secretary to the Admiralty on September 23rd:—

"The enemy aerodrome at St. Denis Westrem (near Ghent) was again attacked yesterday (September 22nd) by a squadron of naval aeroplanes. Results appeared to be highly satisfactory.

"Reliable reports now to hand show that very considerable damage and many casualties have been caused by the previous bombardments of this objective.

"In the early hours of this morning (23rd) the enemy aerodromes at Ghistelles and Handzaeme (near Ostend) were heavily bombarded by a naval aeroplane squadron. All machines returned safely."

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), September 19th, 11.7 a.m.

"Since last night's report five more of our aeroplanes have failed to return."

General Headquarters, September 19th, 9.45 p.m.

"A hostile balloon was brought down by our artillery east of Rausart."

War Office, September 19th.

"*Salonica.*—The enemy camp at Prosenik was bombed by our aircraft on September 18th, with apparently successful results."

War Office, September 20th.

"*Salonica.*—On our Struma front our aircraft carried out a raid on Drama, and bombs were dropped on railway rolling stock and stores."

General Headquarters, September 22nd, 10.47 p.m.

"There was great aerial activity yesterday.

"In the course of the fighting two enemy machines were destroyed and another forced to land in a damaged condition."

War Office, September 22nd.

"*Tigris Line.*—During the night of the 18th–19th instant our aeroplanes heavily bombarded an enemy aerodrome in the Shumran bend of the Tigris (above Kut-el-Amara)."

General Headquarters, September 23rd, 10.59 p.m.

"There was very great aerial activity yesterday. A highly successful raid by about fifty of our machines was carried out on an important railway junction, where much damage was done, two trains containing ammunition being destroyed and many violent explosions caused. A number of other raids on enemy railway works and sidings, aerodromes, and other points of military importance were equally successful.

"In addition, many fights took place in the air, in the course of which three hostile machines were destroyed and five others driven to earth in a damaged condition, besides many others which broke off in the middle of the fight and were seen to be descending steeply, but could not be watched to the ground owing to our machines being too busily engaged.

"Five of our machines are missing."

War Office, September 23rd.

"*Salonica.*—Our naval aircraft dropped bombs on enemy transport near Drama, with apparently good results."

General Headquarters, September 24th, 11.58 p.m.

"Five bombing raids were carried out yesterday by our airmen against railway stations on the enemy's communications, much damage being done.

"In the course of an air fight one of our airmen collided with his opponent. The hostile machine fell vertically. Our machine fell for several thousand feet, when the pilot managed to regain control, and recrossed the lines safely, flying over 30 miles with an almost uncontrollable machine. In all five hostile machines were destroyed yesterday, and two others driven down damaged. Five of our machines are missing."

General Headquarters, September 25th, 11.40 p.m.

"Yesterday six enemy aeroplanes were destroyed in air fights, and at least three others were driven to earth in a damaged condition. Three of our machines are missing."

French. *Paris, September 20th.*

"Yesterday one of our pilots brought down a German aeroplane, which fell near Moislains (north of Péronne).

"*Salonica.*—One of our air squadrons dropped a large number of bombs on Monastir."

Paris, September 22nd. Evening.

"During September 21st one of our aeroplanes dropped on the aviation sheds of Habsheim eight bombs of 120 mm., which hit their mark.

"An enemy aeroplane was brought down as the result of a combat in the air by one of our pilots between Combles and Morval."

Paris, September 23rd. Afternoon.

"On the Somme front our airmen yesterday fought 56 engagements, in the course of which four enemy machines were brought down, while four others were seen to fall in a damaged condition, but their descent could not be followed to the ground. Two other machines were also obliged to come down. During these fights Warrant Officer Dorme brought down his eleventh German machine in the neighbourhood of Goyancourt. Lieut. Deullin brought down his seventh machine south of Doingt. Warrant Officer Tarascon brought down his sixth aeroplane south-west of Hergny. The fourth German machine reported as having been brought down came crashing to the ground south-west of Bocquigny. In the region of Verdun Warrant Officer Lenoir, attacking a German machine at very close quarters, brought it down in its lines north of Douaumont. This is the tenth machine brought down by this pilot.

"Our bombarding squadrons also displayed great activity along the entire Front. In Belgium one of our machines dropped four bombs on hutments in the Forest of Hauthulst. In the region of the Somme a group of 16 French machines bombarded the railway stations of Fins, Epehy and Rosel, and the aerodrome of Hervilly and dropped 80 bombs of 120 mm. North-east of Soissons a depôt of enemy motor cars received 30 bombs.

"Warrant Officer Baron, accompanied by a bombardier, left his aviation camp yesterday evening at 7.15 and reached Ludwigshafen, in the Palatinate, where three bombs were dropped on military establishments. Continuing their route, the airmen dropped three more bombs on an important factory at Mannheim, on the right bank of the Rhine, where a vast fire and several explosions were noticed. Our airmen returned at 12.50 a.m.

"Finally, last night one of our dirigibles bombarded the railway lines in the region of Marcoing, south-west of Cambrai."

Paris, September 24th. Afternoon.

"Yesterday the enemy airmen having shown more activity than usual, our chasing squadrons delivered on the greater part of the front veritable aerial battles. Our pilots gained great successes and indisputably had the upper hand of the enemy. On the Somme front there were 29 engagements. Four enemy aeroplanes were brought down. One fell in the Vaux Woods, two others successively attacked by Sub-Lieut. Guynemer came down in flames after some minutes' fighting. Sub-Lieut. Guynemer consequently brought down the same day his seventeenth and eighteenth aeroplanes. The fourth machine crashed to earth south of Miserey. Three other German machines were seriously hit and fell wrecked near Estrées and in the region of Péronne. Four enemy machines were compelled to come to earth in their own lines.

"It is also confirmed that one of the German aeroplanes given as seriously hit on September 22nd was brought down between Miserey and Villers Carbonnel. More to the south, between Chaulnes and L'Avre, six German machines were brought down. One of them fell in flames near Chaulnes in the course of an engagement between four of our machines and a body of six enemy machines; the second fell at Licourt, the third at Par Villers, the fourth was seen crashing to earth south of Marchelpot, the fifth and sixth were brought down by the same pilot in an engagement between one of our squadrons and six German aeroplanes, and they fell in the region of Andechy, one of them in our own lines. In the region north of Chalons a Fokker fell in flames near our own lines, and another Fokker appears to have been seriously hit. In the Verdun region an enemy aeroplane was fired at by machine guns at close quarters, was winged, and descend on to Pepper Hill. East of St. Mihiel a Fokker dived vertically into its own lines. In Lorraine one of our pilots pursued a German machine for 20 kilometres (12 miles) into its own lines, killed the passenger, and compelled the machine to descend. Another enemy machine came down in the Forest of Gamecy. Finally, in the Vosges two enemy aeroplanes nose-dived into their own lines in an abnormal manner after fights with our pilots."

Paris, September 24th. Evening.

"During the night of September 23rd–24th seven of our aeroplanes dropped 46 bombs of 120 mm., and four of 150 mm. On the factories in the district of Rombach and Thionville, Capt. de Beauchamps and Lieut. Daucourt, each piloting a machine, started at 11 o'clock this morning from their aerodrome and threw 12 bombs on the factories of Essen (Westphalia). Our aviators returned safely to their landing point after accomplishing a flight of 800 kilometres (500 miles).

"During the night of September 22nd–23rd a Zeppelin flew over the Calais district. Furiously bombarded by anti-aircraft batteries, it was forced to make off without dropping any projectiles."

Paris, September 25th. Afternoon.

"Enemy aeroplanes at about 8.30 p.m. yesterday dropped about ten bombs in the region of Lunéville. A woman was slightly wounded, the material damage done being insignificant. Yesterday an enemy machine attacked by one of ours fell in a disabled condition north of Miserey. Three other machines were seriously damaged and were obliged to land. Last night 12 of our machines dropped 98 bombs on the village and station of Guiscard. On the same night seven of our machines dropped 50 bombs on the factories of Thionville and Rombach (German Lorraine) and on the railway station of Audun le Roman. A fire was seen to break out at Rombach owing to the bombardment."

Paris, September 25th. Evening.

"During the night of September 24th and 25th a group of our aeroplanes dropped 150 bombs on the stations of Ham, Hombleux, Manancourt and the aviation ground of Vraignes."

Russian. *Petrograd, September 21st.*

"Our battle aeroplanes made a raid over the region of Lokachi, Rogovichi, and Markorichi, and successfully dropped bombs on the enemy wagons and bivouacs. One of the enemy machines, having engaged us in fight, was injured, and fell steeply down."

Italian. *Rome, September 23rd.*

"Yesterday evening towards sunset a squadron of Italian seaplanes and aeroplanes successfully bombarded the enemy batteries and fortifications at the torpedo station of Panta Salvore. All the machines returned safely to their base.

"Hostile aeroplanes dropped bombs on Monte Vecchio, Maggiore (Vicenza), and in the district of Misurina (Upper Ansiei) without doing any damage."

Rome, September 25th.

"Last night one of our airships, having eluded the enemy's searchlights, dropped bombs on the railway stations Dottergliano and Scoppo, on the Carso. The airship returned safely."

Roumanian. *Bucharest, September 18th.*

"An enemy aeroplane dropped bombs on the town of Turnu Severin."

Bucharest, September 20th.

"Enemy aeroplanes dropped bombs on the town of Constantza, where no one was injured, and on Piatra-Neamtu, where a child of six was injured."

Bucharest, September 22nd.

"Enemy aeroplanes in air attacks dropped bombs on Czernavoda, killing seven men, including two soldiers, and injuring several of the inhabitants. A number of animals were also killed and three houses destroyed."

German. *Berlin, September 22nd.*

"German seaplanes successfully attacked with bombs, two Russian aeroplane mother ships, which, conducted by a cruiser, were bringing several destroyers and aeroplanes to the Bulgarian coast for an attack near Varna. The enemy naval forces were obliged to beat a rapid retreat, pursued by our seaplanes, which later successfully attacked an enemy transport steamer at Constanza and dropped bombs on railway lines in the Northern Dobrudsha. All our aeroplanes, in spite of very heavy firing, returned undamaged."

[*It was officially stated that the Admiralty had no confirmation of these statements.*]

Berlin, September 23rd.

"In aerial fighting north of the Somme we shot down eleven enemy machines."

Berlin, September 24th.

"On the entire Front there has been considerable aerial activity, including numerous aerial battles over our lines and the lines of the enemy, which were favourable to us.

"We shot down 24 machines, 20 of which were brought down in the Somme region. We lost six machines.

"Late in the evening of September 22nd bombs were dropped on Mannheim (on the Rhine). One person was killed and some material damage was done. Enemy aviators also several times attacked the districts behind our lines. In Lille six civilians amongst others were killed and 12 houses were damaged.

"In an air attack yesterday in the region of Essen one child was killed and others wounded. The material damage was insignificant."

Essen, September 24th.

"The General in command at Münster reports that on Sunday, about three in the afternoon, several enemy airmen appeared over a suburb of Essen. Within a minute several small bombs were dropeped in the centre of the town. Most of them caused no damage. Fires did not break out anywhere. Unhappily several children at play were injured by the bombs. After throwing bombs from a very great height the airmen disappeared in a bank of cloud."

Berlin, September 25th.

"In yesterday's numerous aerial engagements we shot down nine aeroplanes. Our anti-aircraft guns have brought down four aviators during the last few days. Six citizens were killed and 28 seriously wounded by an enemy bomb attack on Lens."

"*Balkan Theatre.*—The fortress of Bucharest was bombarded by one of our airships."

Austrian. *Vienna, September 23rd.*

"A squadron of enemy naval aeroplanes ineffectively dropped a number of bombs near the Punta Salvore (southwest of Pirano)."

Turkish. *Constantinople, September 23rd.*

"A Turkish aeroplane dropped 10 bombs on the armoured ship 'Empress Mary' and some destroyers. The 'Empress Mary' was observed to be hit several times."

Constantinople, September 25th.

"*Gallipoli.*—We prevented a reconnaissance by an enemy aeroplane on the Gallipoli Peninsula."

Bulgarian. *Sofia, September 21st.*

"German aeroplanes attacked with success the enemy's railway line near Cernavoda, and caused great damage.

"A Russian squadron comprising twenty fighting units bombarded without success the heights to the north and east of the village of Pervelia.

"Seaplanes frustrated an attack by hostile seaplanes on Varna."

Sofia, September 22nd.

"German aeroplanes successfully bombarded the Danube bridge at Cernavoda and enemy camps near the villages of Cochirleni and Ivrinez."

From Other Sources.

Writing from Petrograd on September 14th, Reuter's correspondent states :—

"A squadron of four Russian giant aeroplanes of the Ilya-Murometz type bombarded the German seaplane station on Lake Angern, in the Gulf of Riga. Seventeen seaplanes of various sizes and models were discerned. The Russians dropped 73 bombs, of a total weight of 62 poods (about 1 ton). The sheds were soon concealed in smoke and flames. Eight enemy seaplanes attacked the Russian machines, but were speedily put to flight by machine-gun fire. As the result of the bombing and the air fight not fewer than eight enemy machines were destroyed or put out of action. The Russians returned safely, notwithstanding a hail of incendiary shells from anti-aircraft guns. On a previous occasion one Ilya-Murometz with a crew of five routed seven attacking German seaplanes."

Mr. W. Beach Thomas, writing to the *Daily Mail* from the Somme front on September 16th, in connection with the advance in which the new armoured motor cars played such a big part, states :—

"Such a battle has too many parts to suffer description. The battle in the air has perhaps never been equalled. The prisoner, who complained of the 'Tanks,' concluded by saying that they were anyway better than the aeroplanes. How many fights there were no one knows. I believe we destroyed more than the 13 enemy planes officially recorded. The enemy kite balloons bob up and down in terror after the havoc in their ranks.

"Village after village just behind the lines was bombed, and to complete the work the airmen came down low enough almost to stroke the back of the 'Tanks,' quite low enough to empty their bullet-drums at the enemy's infantry. The

'Archies' fired at them in vain, though, as it seemed to me scores of our craft were perpetually rolling across the sky on ball-bearings of shrapnel cloud. From half an hour before dawn till sunset there was a constant sky patrol enemywards and a continuous *chassé* over our advancing troops and the enemy's batteries. Every headquarters that day rang with aircraft messages."

Mr. Philip Gibbs, writing to the *Daily Telegraph* on the same subject, says :—

"Machine-gun fire rapped out in fierce spasms, and the German 'Archies' were throwing up shells which burst all about the planes of our airmen, who came like a flock of birds over the battlefields, flying low above the mists. Long after the sun was at its height there was the white ghost of the moon in the other side of the sky, and it was a strange and beautiful thing to see these aeroplanes of ours shining as though with aluminium wings as they flew through the shell-bursts. They did wonderful things yesterday, those British air-pilots, risking their lives audaciously in single combats with hostile airmen, in encounters against great odds, in bombing enemy headquarters and railway stations and kite-balloons and troops, and registering or observing all day long for our artillery. They were out to destroy the enemy's last means of observation, and they began the success of the battle by gaining the absolute mastery of the air. Thirteen German aeroplanes (since reported by Sir Douglas Haig to be 15) were brought down, and their flying men dared not come across our lines to risk more losses. . . .

"These soldiers of ours were superb in courage and stoic endurance, and pressed forward steadily in broken waves. The first news of success came through from an airman's wireless, which said :—

"'A "Tank" is walking up the High Street of Flers with the British Army cheering behind.'

"It was an actual fact. One of the motor monsters was there, enjoying itself thoroughly, and keeping down the heads of the enemy. It hung out a big piece of paper, on which were the words :—

"'GREAT HUN DEFEAT. SPECIAL.'

"The aeroplane flew low over its carcase machine-gunning the scared Germans, who flew before the monstrous apparition. Later in the day it seemed to have been in need of a rest before coming home, and two humans got out of its inside and walked back to our lines."

The *Times* special correspondent in his despatch of the same day states :—

"As the sun rose we saw a beautiful sight above us, for in the sky there appeared suddenly a cluster of points of fire. Not far from them our aeroplanes were circling, and we wondered for a while whether these fire sparks were some new form of anti-aircraft shell which the enemy had devised or whether they were something which one of the aeroplanes had thrown out. Then suddenly a little mist obscured the sun, or perhaps they changed their angle all at once, and lo! we saw that they, too, were aeroplanes. The sun's rays striking upwards had illuminated them so that each glittered as a mirror glitters, and, too dazzling to have any definite shape, had stood only as a point of fire against the blue of the sky.

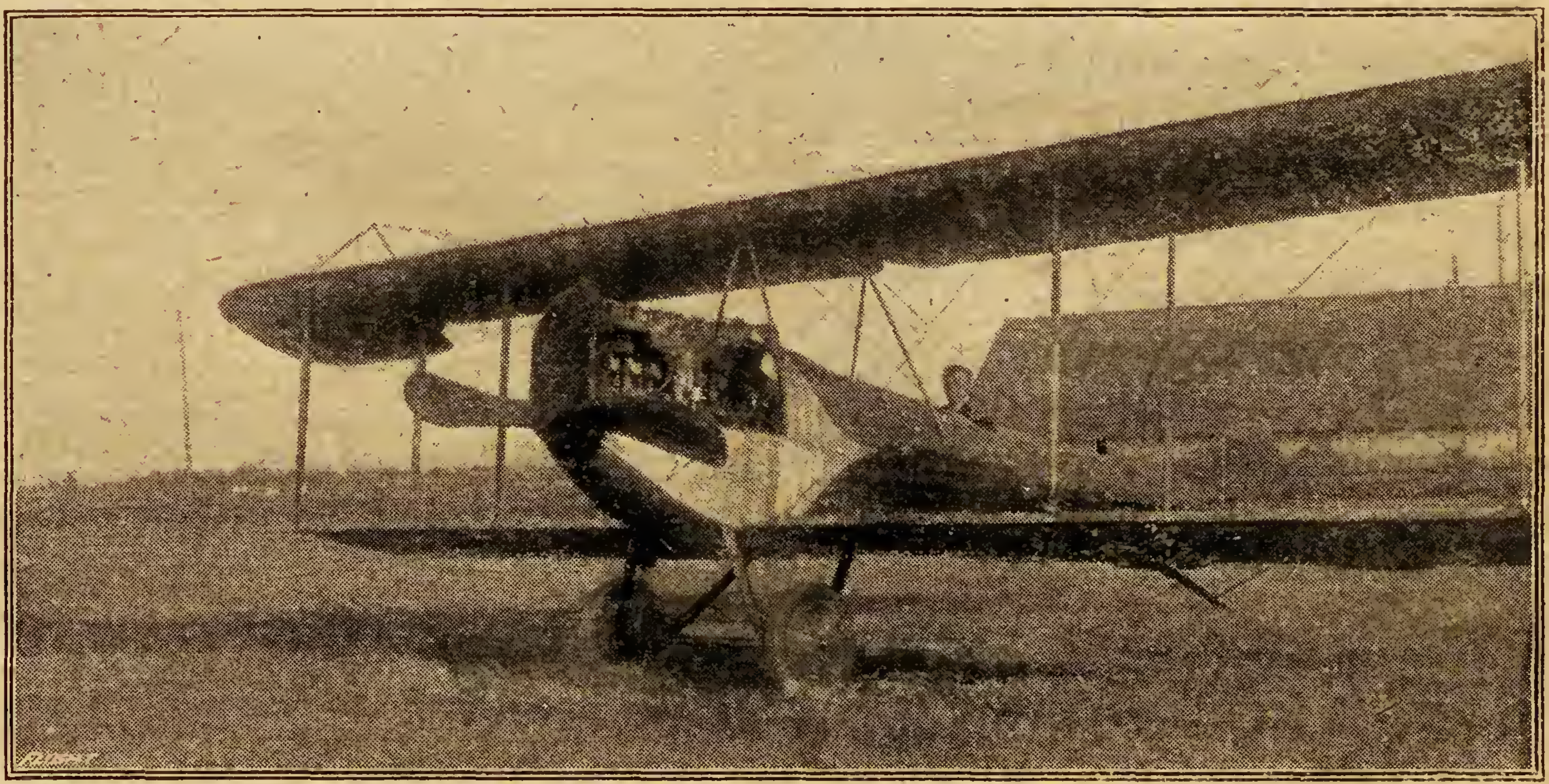
"The official *communiqué* has already told you briefly how well our aeroplanes did that day. That they destroyed 15 enemy machines and drove down nine others in a damaged condition to the ground was only a detail of their achievement. They came down low enough to use their machine guns against the enemy's guns and on his infantry in their trenches, and all the time, from their eeries in the clouds, they watched and understood and reported each change in the progress of the fight. To us down below they were not only a beautiful sight, but an amazement and an exaltation. If only one could shout and hail them and tell them how one admires them and glories in them up there, in their superb dominion of the air above the battle! Often the enemy's shrapnel burst thick about them, sometimes chasing one machine across the blue, sometimes bursting in bouquets among a fleet, as if the gunners were shooting blindly 'into the brown' of them. And nothing stops them in their appointed work; but always they swing and circle, pass and re-pass, rise and dip and bank and turn, proudly careless of themselves, caring only that the mastery of the air is theirs —and ours—and that we shall hold it."

Mr. G. Ward Price, in a despatch dated September 15th, from the British front in Macedonia regarding the British advance, notes :—

"From the hilltop where I was one could see the earth of the smashed entrenchments flying into the air, but besides these natural observation posts there was a French kite balloon anchored high above our heads, from which, with the extraordinarily good glasses served out to the French ballooning officers, the observers would just be able to see the very figures of the Bulgars in their trenches, if, indeed, there were any who were not as deep underground as they could go. English aeroplanes, too, sailed to and fro, keeping station like wild geese above the valley."

The *Daily Mail* correspondent at Bucharest, writing on September 14th, reports :—

"On Tuesday night waterplanes successfully bombarded Varna (the Bulgarian port on the Black Sea), dropping over 50 bombs. Many large fires were seen in the port."



ONE OF THE LATEST CHRISTOFFERSON TRACTOR BIPLANES FITTED WITH 125 H.P. HALL-SCOTT MOTOR.—The Chinese Government has placed an order for 25 similar machines.

The *Daily Telegraph* correspondent in Milan, writing on September 14th, says:—

"To-day's official bulletin reports another bomb outrage on Venice by Austrian biplanes, in which they succeeded, after a flight of some 40 miles, in making a fairly good hit at the church of San Giovanni and Paolo, and the old-age poor asylum. The damages, happily, are stated to be slight, but the persistency with which the Austrians, while pretending to aim at alleged fortifications, which do not exist in Venice, succeed in hitting famous monuments, is peculiar.

"San Giovanni and Paolo is well known to every *habitué* of Venice. It was long ago declared a national monument, and stands in the midst of the Campo di San Zanipolo. It is the second largest church in Venice, and contains the tombs of more than twenty Doges. The edifice was built in 1430 in the Italian Gothic style, on the spot where an ancient oratory had stood. Owing to its being the resting-place of so many Doges it has often been called the Italian Panthéon. It contains also many paintings by the best Italian masters.

"If these vandal raids continue on Venice, it is not impossible that this sacred building, like many others, from having been a monument of Italian glory, may become a ruined monument to Austrian shame."

A Reuter message from Salonica on September 13th reports:—

"Two days ago Bulgarian aeroplanes dropped bombs on the outskirts of Kavala, killing six Jews and three Greeks and wounding many others. British and Russian warships are shelling the forts and heights around Kavala, which are occupied by the Bulgarians. Col. Christodoulos, with the remnants of his division and his guns and munitions, is expected to arrive here (Salonica) daily."

In an article on the French advance last week, the *Petit Parisien* says:—

"Admirably protected by the artillery, large numbers of aviators went up, and every quarter of an hour they made reports to General 'G,' throwing down notes containing all possible details. The majority of the aviators flew at a height of 150 metres.

"An extremely important position was taken by assault south of the Priez Farm, where the Germans had organised a veritable labyrinth of fortifications protected by numerous machine guns. Our artillery, advised by the aviators, had found the exact range, and wrought such destruction among the machine guns and shelters that the Germans were forced to abandon this strong position, an operation in which they were materially assisted by the vigorous assault of the French infantry."

The *Times* correspondent at the British Headquarters in France, writing on September 13th, notes:—

"They have generally been beautifully clear autumn days, though the mornings have been hazy and the visibility conditions poor until the sun has dispelled the mist. Then our airmen have had their chance—and have taken advantage of it.

"The day before yesterday three of our machines tackled a party of five enemy aeroplanes well behind the German lines beyond Thiepval. As soon as we attacked two of the German airmen went down. The other three stayed and fought until one was sent crashing to the earth, when the other two also dropped to safety.

"The official *communiqué* has told you how in the fighting of Saturday evening our aeroplanes followed our attacks, and, flying low, joined in the battle by using their machine guns on the enemy's troops.' This is by no means the first instance of this being done, and I have quoted before passages from the letters and diaries of prisoners testifying to the audacity of our airmen and the terror with which the enemy regards them—'until you almost expect them to come down and drag you out of the trench,' as one man wrote.

"Yesterday I heard from prisoners much more talk to the same effect. The Germans all seem to have acquired a complete contempt for their own air service. They say that if an officer wants to get fat he joins the Flying Corps, the officers of which do nothing but go and sit in the theatre at Lille with their breasts all covered with medals. It is doubtless unjust. We know that our own flying men have a most chivalrous regard for their enemies in the air. But the bitterness on the subject among the German troops is universal, and is extraordinary testimony to the superiority of our own men.

"Being practically without direct observation now from the high ground, the enemy has more than ever need of a competent air service. To-day he was doing his best to fill its place with a larger number of kite balloons than he has had up for a long time. They were especially numerous beyond Ginchy, at a safe distance behind his lines, and they were sufficient evidence of the straits that he is now in."

Writing two days later, he says:—

"The weather has been dull, with rain at intervals, and the clouds so low that aeroplane work would seem hardly practicable. But it is an inspiring thing to see our airmen, through wind and rain, below the clouds or among them, passing and repassing overhead, always patrolling the whole line of the battle front. Our flying men continue to dominate the air in a way which is, we know, very discouraging to the German troops, and must be intensely humiliating to German airmen. A German might well be afraid even to build a castle in the air nowadays.

"Now and again—especially after a few dull days when our men have been prevented from doing their worst—the enemy airmen pluck up courage and try to become aggressive. Thus, on September 7th, we are told in the official reports (there had been more or less rain on the three preceding days) 'the enemy's activity was considerably above the average. Several of his machines attempted to cross the lines for a short distance.' One of them was brought down.

"And this 'activity above the average' was at a time when every day our men were flying over every point of importance within 30 miles of the Front, and sometimes reaching places 70 miles away. They were dropping bombs on railway lines and depôts and ammunition stores and columns of transport on the road. They dipped down low to use their machine guns on marching troops. They attacked and destroyed the enemy's observation balloons. They even slid out of the clouds and—audacity could go no further—engaged and routed the anti-aircraft guns themselves!

"As for the way in which they bully the enemy's machines when they can get at them, a few specific examples will illustrate it. On September 1st Lieut. —— 'encountered a formation of 12 Rolands.' Naturally, Lieut. —— got away as fast as he could. Did he? Read this:—

"'He dived in amongst them, firing one drum. The formation was broken up. Lieut. —— then got under the nearest machine and fired one drum at 15 yards under the pilot's seat, causing the machine to plunge to earth south-east of Bapaume. Shortly afterwards some more hostile aeroplanes came up in formation. Lieut. —— attacked one, which went down and landed in a gap between two woods. Several other machines were engaged with indecisive results, and, having expended all his ammunition, Lieut. —— returned.'

"It was careless of Lieut. —— not to have more ammunition about him; but what is one to say to a man like this, who spends a happy day in tackling, first, 12 enemy machines and then 'several' more, diving into them like a hawk into a flight of pigeons and simply 'shooing' them all over the sky?

"And that same evening another lieutenant took a hand in the game of fluttering Volscians. The covey which he ran into had only eight birds. He picked out one—doubtless the old cock, though the report does not say so—which 'went down in a spin' (you know how a bird does it sometimes) 'falling near Bapaume.' The neighbourhood of Bapaume seems to have been fairly sprinkled with damaged enemy aeroplanes that day.

"Another two officers 'encountered six enemy machines near Cambrai.' Then follows:—

"'While he was diving at the hostile patrol leader three hostile machines dived on to the tail of Lieut. A.'s machine. One of the enemy machines was engaged by another pilot, while Lieut. B. engaged another and fired 2½ drums into it as it passed across the tail of his machine. This enemy machine made a vertical dive with a stream of smoke pouring out behind. Lieut. A. turned and opened fire on the third machine with his front gun, firing about 20 rounds at it. The pilot turned and got under the tail, and Lieut. A. also turned and fired another 20 rounds into it, after which it was seen to dive vertically out of control and to turn on its back. The remaining hostile machines dispersed, and were seen to land west of Cambrai.'

"On another occasion one of our machines was attacked by four of the enemy, but, 'turning sharply, emptied one drum into the nearest at 20 yards range,' when the enemy turned on his side and fell. The pilot then attacked another machine which was just above him, firing a drum and a half at close range. The Roland turned a complete cartwheel on its right wing tip, and fell out of control.

"These little exploits are only incidents in the regular daily work of our flying men. Their most important job is spotting enemy gun positions and other things so that our own guns may get on to them. On one day 132 targets are thus 'dealt with.' On another day our men go bombing an aerodrome, and they see the enemy wheeling all their machines out of the sheds—which they know will be bombed—so our men drop a little lower and bomb the machines in the open. Another time they go for a factory and 'a big explosion occurs.' Then it is a railway station which 'is hit in several places.' Or they come down and use their machine guns on the soldier workers massed about a pithead, or on 'the enemy's support lines,' or 'the second line hostile trenches south of Beaumont Hamel.'

"One does not wonder that the Germans in their trenches hate our aeroplanes. What one does wonder at is that now for two months and more this thing has been going on, and that it is only in bursts, when the protection of bad weather has given the enemy a chance to pull himself together, that the German airmen attempt the initiative at all."

Capt. Philippe Millet, writing from Paris on September 22nd, to the *Observer*, says:—

"The minuteness of the preparation is surely one of the most comforting features of the new war. It is generally known that, in order to make sure that all the enemy works have been properly destroyed, photographs are repeatedly taken by aeroplanes. But this is not considered enough. All these photographs are submitted not only to the divisional staff concerned, but to all the company commanders who are to lead the attack; they are required to state whether they think that the destruction is complete, and, whenever there appears to be a doubtful point, to send out a patrol to confirm by direct inspection of the ground the results shown by the photograph. Then, and not before, the infantry attack is launched. Here begins the second stage.

"Everyone acquainted with trench warfare knows what the root difficulty was up to the present advance. It had been quite rightly assumed that the attacking troops must only advance under a protective curtain of shells. On the other hand, as all the wires are cut as soon as a battle begins, one did not see how to make sure that the moving curtain of shells would precede the attacking infantry without going too fast or—which was a more ominous danger—too slow. The difficulty seemed so insuperable that some of the best artillery officers suggested that the only way out was to time exactly beforehand the movements of the attacking troops with the lengthening of the range. Any advance under such a system would have had to proceed according to a sort of railway time-table.

"Fortunately, another solution was found, since the Allies have achieved the mastery of the air. The connection between the advancing infantry and the artillery is now ensured by the so-called infantry aeroplanes. Each French division is provided with a number of these. Their task is to follow closely the advancing line, not in order to fire on the enemy, but simply to report to the gunners and let them know exactly what is going on. As soon as the infantry has reached a given point, the 75's are informed that they must lengthen their range beyond it so as not to hit our own men. Information is similarly given if the infantry happens to be held up by any unsuspected obstacle, or if a German counter-attack is seen coming up from the rear.

"The way in which this new device has worked on the Somme is simply marvellous. It is mainly to this scientific system that the troops owe the fact that they have been able to advance under a curtain of shells which moved continuously ahead of them at a distance of 200 or 300 yards."

A distinguished worker at the Front, describing his impressions on a recent tour of inspection, in a letter home, which was published in the *Times* of September 25th, says:—

"From Albert we went on to La Boiselle, which I had seen through a periscope from the front-line trenches in May There is little of it left now. Our guns were blazing away, and I counted 19 flying machines of sorts in the air at one time. Some were observing balloons, so-called sausages, of which we have a line at equal intervals; the others were aeroplanes, all British. The Boche was not showing, and very seldom does in front of his Army, where we are in great aviation strength and easily command the air. . . . After tea went to an aerodrome not far off.

"A storm was threatening and the aeroplanes began to come in sooner than they intended, because in a storm, or some storms, the compass-needle whirls about so that all sense of direction is entirely lost. The storm came and gave me a chance for a long talk with the officers. They were nearly all very young, of very slight build, and had those curious eyes which seem to come from long looking into the distance. I think they remain permanently more widely open and that the effect is produced in that way, but I am not sure of it. Aeroplanes belonging to a neighbouring squadron passed over during the storm; my friends thought it foolish not to come down at once on their ground, but I rather think that each prefers his own to his neighbour's home. When the storm ceased one of them went up to practise firing his machine-gun at a target on the ground; he rattled off a great number of shots in a very short time, but I was told that it was much easier to hit a moving than a stationary object."

Aircraft Work in Egypt.

IN the despatch, published in the *London Gazette* of September 26th, from General Sir Archibald Murray, the Commander-in-Chief of the Egyptian Expeditionary Force from January 9th, 1916, to May 31st, there are several references to the work of the R.F.C. In dealing with the survey of the Canal zone, General Murray says that co-operation in this work has been part of the routine of the R.F.C.

Other quotations are as follows:—

"Up to the middle of February aeroplane reconnaissance was the only active military operations possible, owing to the need for reorgansing the units of the force and for pushing on the work of laying roads, pipe lines and railways to enable an adequate force to be maintained on, and beyond, the front lines. . . .

"On April 22nd the R.F.C. reported to No. 3 Section that new bodies of enemy troops were at Bir-el-Bayud, 15 miles E.S.E. of Qatia, and Bir-el-Mageibra, 10 miles S.E. of Qatia. . . .

"The Turks were pursued in their retreat by the 5th Australian Light Horse, who had only arrived at Qantara at 1 p.m., and by aeroplanes, thereby suffering further loss. . . .

"Aeroplane reconnaissance on the evening of the 23rd established the fact that the enemy force, which included a large body of picked Turkish regular troops, was already retiring. At dawn on the 24th eight machines of the 5th Wing, Royal Flying Corps, made a bomb and machine gun attack from a low altitude on the enemy troops left in Qatia, causing very heavy casualties and completely destroying the camp. One machine also located and attacked a large body of enemy at Bir-el-Abd, and located another party retiring on Bir-el-Bayud. On the morning of the 25th further bomb and machine gun attacks were made by the Royal Flying Corps on enemy forces at Bir-el-Abd and Bir-el-Bayud. Both attacks were extremely successful, working great havoc among men and animals.

"I cannot speak too highly of the admirable work done by the 5th Wing, Royal Flying Corps, during these few days. The strain thrown on pilots and machines was very heavy, and the former displayed the utmost gallantry and resource on all occasions. Chiefly through their efforts the enemy was made to pay a very heavy price for his partially successful raid."

General Murray also submits the following list of names of officers, N.C.Os. and men whom he considers deserving of special mention:—

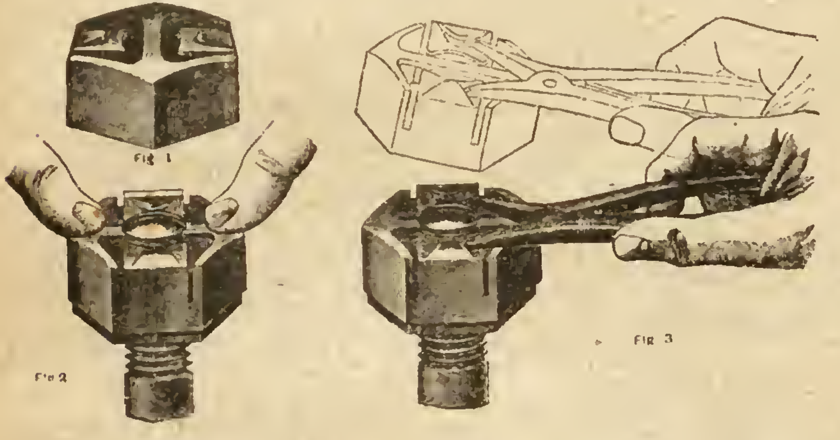
"*Royal Flying Corps.*—Salmond, Brevet Lieut.-Col. (Temporary Lieutenant-Colonel) W. G. H., R.A.; Freeman, Capt. (Temporary Major) W. R., Manch. Regt.; Blackburn, Capt. H., Special Reserve; Lucas, Lieut. (Temporary Capt.) Rt. Hon. A. T. Lord, Hants Yeo.; Bowden, Lieut. (Temporary Capt.) C. R., Worc. R.; Minchin, Lieut. (Temporary Capt.) F. F., Can. Local Forces; Bellamy, Temporary Lieut. F., General List, New Armies; Gardner, 2nd Lieut. (Temporary Lieut.) G. D., Yorks R., Special Reserve; Hill, 2nd Lieut. C. W., Special Reserve; Davies, 2nd Lieut. T. G.; Baillie, Temporary 2nd Lieut. W., General List, New Armies; May, No. 167, Flight-Sergt. A. R.; Meynell, No. 2988, Flight-Sergt. E.; Green, No. 136, Flight-Sergt. H.; Hellyer, No. 718, Flight-Sergt. F. J.; Whilton, No. 198, Sergt.-Major F.; Felstead, No. 605, Sergt.-Major G."

Ninety Years Ago.

Ballooning.—Mrs. Graham ultimately landed at Newington Green, where the balloon was seized by some brickmakers and cut to pieces, because a sufficient quantity of beer was not distributed among them.—(*From the* " *Sunday Times* " *of September* 24*th*, 1826.)

The Crown Locking Nut Cap.

Devices for locking-nuts there have been in plenty, but few have found favour to any extent. One objection to many devices is that they are bulky. This, however, cannot be urged against the Crown cap, which is a steel stamping fitting closely over the nut and so taking up practically no more room than the nut itself. All that is necessary is for a slot to be cut in the bolt or stud to accommodate the bar of the cap, which is then pressed over the nut, and the two tongues ratchet over the threads, thus effectively locking the cap. When it is desired to remove the cap, it is only necessary to force back the tongues. This can easily be done by a pair of pliers opening in the reverse direction to the normal. The use of this special tool is not necessary, but where the locking caps are in constant use it will be found a great convenience, as the caps can be removed without being damaged in any way. The makers are the Crown Locking Cap Co., of 1, Bank Chambers, Bromsgrove Street, Birmingham, and the cap is made in sizes from $\frac{3}{16}$ to $2\frac{1}{4}$ ins.



THE CROWN LOCKING CAP.—Fig. 1 shows the locking cap ready to fit on a nut. Fig. 2. Fixing the cap on the nut. Fig. 3. Expanding the clips and removing the cap from the nut.

The Federation of British Industries.

To provide a body capable of representing the interests of the British Manufacturing and Producing Industries is the object of the Federation of British Industries, which has just been formed. The President is Mr. F. Dudley Docker, C.B., while the Executive Council of 30 or 40 includes Sir Vincent Caillard (Vickers, Ltd.), Mr. F. R. Davenport (Willans and Robinson), Mr. Godfrey C. Isaacs (Marconi Wireless Telegraph Co.), Mr. E. Manville (Daimler, Ltd.), the Right Hon. Sir George H. Murray (Sir W. G. Armstrong, Whitworth and Co.), Mr. A. W. Tait (British Aluminium Co.). Full particulars can be obtained from Mr. R. J. Nugent, 51, Lincoln's Inn Fields, W.C.

The Sunbeam Charity Sports.

It was a happy thought when the employees, supported by the directors, of the Sunbeam Motor Car Co., Wolverhampton, decided to promote sports in aid of the Wolverhampton Charities. These sports held at the Molyneux Grounds on September 16th were well attended, a crowd of about 7,000 persons being present. The weather was all that could be desired, and the racing events to the number of 10 were well filled. The prizes were distributed by the veteran chairman of the company, Alderman John Marston, J.P., supported by Mr. W. M. Iliff, Mr. H. J. Bath, Dr. Deansley (directors), Mr. Alfred Bird, M.P. for West Wolverhampton, and others of the staff of the company. It is intended these sports shall be an annual event. Mr. C. H. Palmer and Mr. Cooper made two admirable secretaries.

For Light Pressed Steel Stamped Work.

To facilitate prompt delivery and attention, all communications for Messrs. Joseph Sankey and Sons, Ltd., who specialise in undershields and other light-pressed and stamped work in steel, aluminium, &c., for aeroplanes, should henceforth be addressed to them at Hadley Castle Works, Wellington, Shropshire.

A " Winged " Treasure in the Trenches,

" A week ago," writes a Corporal in the A.S.C., M.T., " I dropped my ' Swan ' fountain pen near the trenches in the dark, and as it meant pretty certain sniping if I lit a match, I reluctantly had to abandon it. This morning I was passing that way again, and found my lost property 50 yards from where I had missed it. Apparently a bursting shell had blown it down the road. I have had the pen in constant use ever since the early days of the war. That it stood the rough usage without ever failing me, and was as smooth in writing at the end as when first I had it, bears evidence of ' Swan ' excellence and utility for soldiers at the Front."

Thousands of " Swan " pens are being used by our men at the Front and in the Fleet, and, in truth, what more useful present could be sent to either soldier or sailor ? Our readers would do well to ask the manufacturers, Mabie, Todd and Co., Ltd., 79 and 80, High Holborn, London, W.C., for their free booklet giving full particulars.

◆ ◆ ◆ ◆

PUBLICATIONS RECEIVED.

In the Royal Naval Air Service : being the War Letters of the late Harold Rosher. London : Chatto and Windus. Price 3*s.* 6*d.* net.

Smithsonian Miscellaneous Collections. Vol. 62, No. 5. *Dynamical Stability of Aeroplanes.* By J. C. Hunsaker, Eng.D. Washington, D.C., U.S.A. : The Smithsonian Institution.

Flying Men and Their Machines. By Clarence Winchester. London : J. M. Dent and Sons, Ltd. Price 6*s.* net.

With Wings Outspread. By Marc Gouvrieux. London : William Heinemann. Price 5*s.* net.

Aeronautical Engines. By F. J. Kean, B.Sc. (Lond.). London : E. and F. N. Spon, Ltd. Price 6*s.* net.

Courts of Inquiry on Illegal Absence. By Capt. A. A. Scanlan, A.S.C. London : Forster, Groom and Co., Ltd. Price 1*s.* 6*d.* net.

Announcements, Educational and Social, for the Session 1915–1916. Northampton Polytechnic Institute, St. John Street, London, E.C.

Catalogue.

Aircraft Accessories and Equipment. Brown Brothers, Ltd. Great Eastern Street, E.C.

◆ ◆ ◆ ◆

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Aeronautical Patents Published.

Applied for in 1915.

Published September 28th, 1916.

12,991. G. A. Chaddock. Mechanically air-borne ship.

Applied for in 1916.

The numbers in brackets are those under which the specification will be printed and abridged, &c.

Published September 21st, 1916.

832. C. Barrett and G. Morrow. Self-controlled airships or aerial machines for dropping bombs. (101,231.)

Published September 28th, 1916.

140. M. A. Codd. Lamps for aircraft, &c. (101,300.)

1,178. Soc. Anon. Spad pour l'Aviation et ses Derives. Aeroplanes, &c. (100,122.)

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EDITORIAL COMMENT.

Air Raids and Reprisals.

HAS not the time now come when we should embark upon a severe policy of reprisal in answer to the continued German air raids on this country? Until now we have refrained from advocacy of raids in reprisal, because we have endeavoured to maintain a feeling that even if we are fighting an enemy who has no elementary idea of the decencies of civilised war, there is no need for us to descend to his level. In our little wars of the past we have been accustomed to the mutilation of our wounded and the murder of those of our people unfortunate enough to fall into the hands of a savage enemy. We have bargained with the fact that civilians, men, women and children, would pay the last penalty if taken. But we have always refrained—and properly refrained—from reprisals in kind, recognising that we were fighting savage enemies whose code of war recognised no nice distinctions. They had generally never heard of Geneva and Hague Conventions, and understood nothing of the niceties of international law and the amenities of civilised war—if, indeed, *any* war *can* be called civilised.

But the question most distinctly arises now, whether we are justified in continuing to fight Germany with the gloves on? Every week, and sometimes more than once in the week, our shores are raided by hostile aircraft, from which bombs are dropped on open and defended places alike, killing and wounding civilians, and among them a high proportion of women and children. We are not "squealing" about it. The German contention is that as a consequence of the aerial threat a large number of troops are kept in England and munitions which would otherwise be used in France have to be kept here. They claim also that the object of the raids is the destruction of munition factories and stores and the bombardment of fortified places. Well, supposing we allow all this and concede that they are carrying out a legitimate enterprise of war. It may be remarked, *inter alia*, that if their real object is to destroy places of military importance, it would help them to achieve that object with greater certainty if they would fly low enough to make sure that their bombs reach the real target and do not fall harmlessly—from the military point of view, that is—in residential thoroughfares. True, they would make better targets for our guns, and our aeroplanes would doubtless prefer to see them flying lower than they do. We are assured, however, by the German Press that the object of the raiders is not to get back safely, but to do the maximum amount of military damage. If they would come down to a thousand feet, say, they would make much better practice in their bomb-dropping. They would return to the Fatherland in even smaller proportion than they do now, but, according to their own story, that does not matter.

So far as producing any effect on the war is concerned, the raids leave the nation cold. They irritate, but nothing more. We don't like them—it would be folly to pretend we do—and would gladly see them cease for the sake of the poor women and little children who die and are mutilated in them. We are forced to the opinion that there is one way, and only one way, to bring about their cessation. That is by counter-raids on enemy towns. Such raids may quite justifiably be described as defensive, and the defence of these shores is as much a legitimate enterprise of war as the object sought to be attained by the enemy and which we have tentatively conceded to him. The enemy might even be told that every raid on England will be countered by two on German towns, and that we intend to proceed on a policy of "no raid, no counter."

It is not for us to indicate how, when and where such counter-raids can be carried out. It is sufficient for the moment that we record the fact that "FLIGHT," which has hitherto pronounced against a policy of reprisal, has reluctantly come to the conclusion that the only way to cure a German is with his own medicine.

* * *

Preparing for After the War.

Not the most optimistic among us can envisage the end of the war yet. Viewed from the most sanguine point of view, it looks as if it were safe to go on for at least another year, thus justifying the forecast of that great soldier and statesman, Lord Kitchener. True, something unforeseen may happen to put an early period to hostilities. There may be a revolution in Germany. Any one of half-a-dozen things may happen to accelerate the day of peace. But, on the other hand, the war may have to be fought out to the bitter end of a military decision. This is by far the most probable course for events to take. Whatever is to befall in either of the directions indicated no man can foresee. This, however, all men may be certain of, that the war must at some time or other come to an end and the period of reconstruction commence. And even more for the reason that we cannot tell how soon the time may come, or for how long it may be deferred, it behoves us to make preparation for the economic battle which is bound to be as bitter as the actual clash of arms.

The subject is one we see dealt with daily from almost every conceivable point of view. It is one upon which there are no two opinions. We are all agreed that we must prepare, and that in due season; but it is difficult to discern that up to now we have done much more than agree upon the point. Admittedly, the times are very difficult. People are so intent upon the first business in hand—that of winning the war—that it is hard to spare time and attention to problems that are not, as it were, of the moment. It has ever been a rather unfortunate characteristic of the nation that it is disposed to let to-morrow take care of itself. In no small measure it is that characteristic for which we are paying so heavy a price in blood and treasure now, and it is a characteristic which will have to go out of our lives, public and private, if the nation is to reap the full benefit of its sacrifices. We would go even farther than that, and say that it must disappear if we are not to meet a defeat in the fields of commerce that the enemy cannot inflict upon us in war.

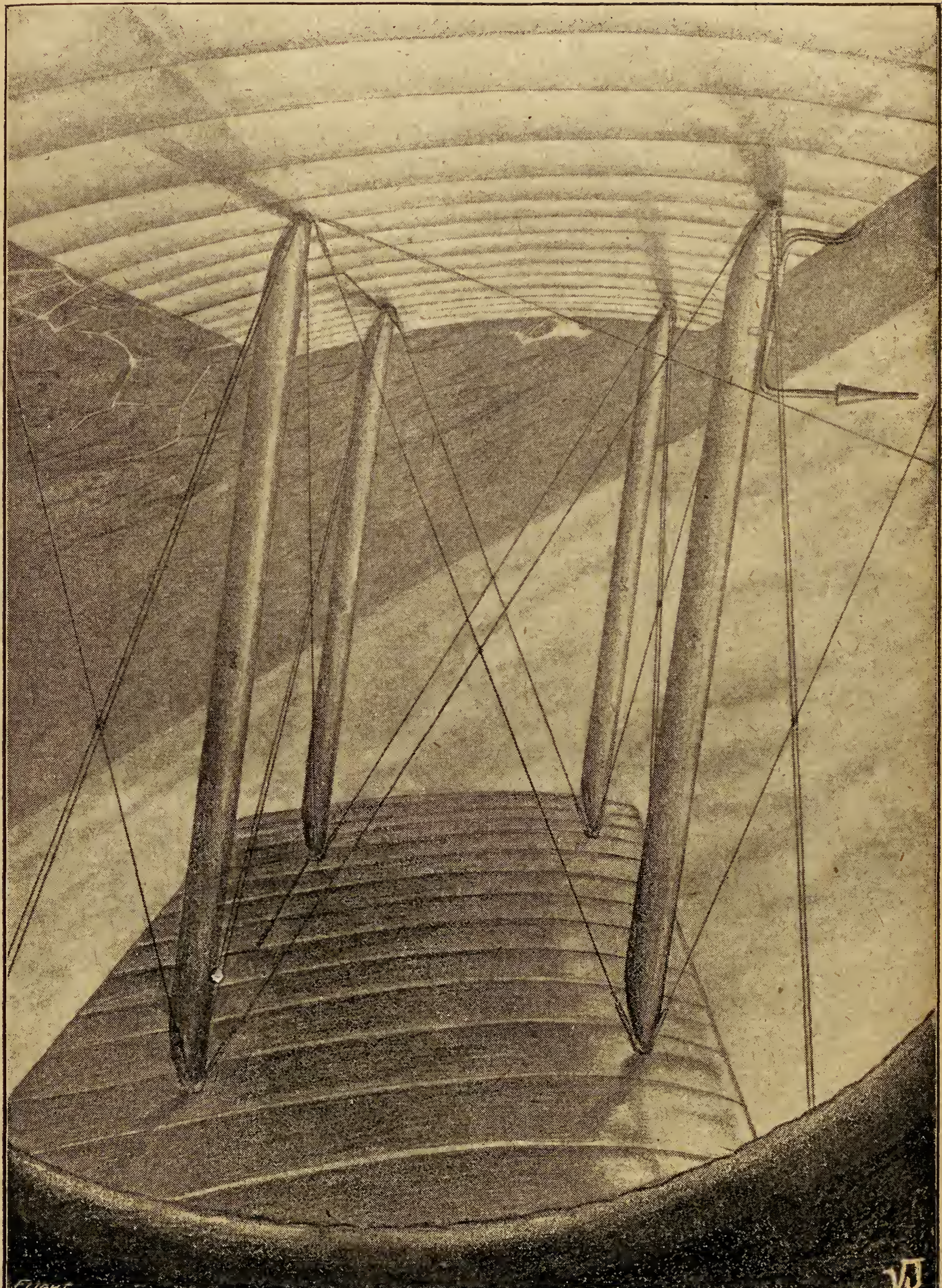
All this being so, it is up to us as individuals and as a nation immediately to take active steps in the direction of preparation for the commercial war that is to come. Take the case of the aviation industry as one in point. The war has done immeasurable good to the trade, no matter from what point of view it is regarded. Design, both of machines and of engines, has progressed at a tremendous rate. Not only so, but from occupying quite a minor place two years ago, the aviation industry of this country has achieved the lead. British aeroplanes and British engines are in the van—and ought to remain there. But they will not unless we prepare to keep them there when the demand created by the war has ceased and other outlets are necessary for the enormous production now achieved.

Naturally, one of the first questions arising is: What will be the fields open to be covered? Will not the cessation of the war demands mean a virtual closing down of the industry? Is there, in fact, a commercial future for aviation; a future so immediate, that is, as to warrant optimism on the part of those who are now of the industry?

These questions are so interwoven one with another that they can best be answered generally rather than specifically. *Imprimis*, the war has brought commercial aviation the nearer by several decades. Bear in mind the tens of thousands of miles that are flown every day, practically without accident. (Battle casualties are not accidents.) Also the wonderful duration flights that now and again emerge through the official reports. Remember, too, that not a tithe of the aerial activity on any of the Fronts comes to the knowledge of the man in the street, and then try to visualise the magnitude of the whole thing. Remember, also, that the censorship will not always exist, and that in the proper time all the mass of experience gained in war flying will be available to develop the more peaceful side of the movement. Even apart from this more peaceful side, there must be a general stocktaking and reorganisation of the world's military forces, since it is futile to think that this or any other war will be the last. Humanly speaking, so long as all law and order rests on an ultimate basis of force, so long will there be wars. Which is to say, as we had occasion to forcibly point out, that as long as human nature remains wars are not only possible but inevitable.

Aircraft are an indispensable adjunct of military power, so in that direction alone there will be great business to be done. The South American Republics, China, Spain, as well as our Allies, offer a field which will require covering in the face of strenuous opposition not only from Germany but from our friends as well, and unless we start soon and early we shall inevitably find that we have once again handicapped ourselves by leaving too much for the morrow. The Indian proverb that "To-morrow is also a day," has much of philosophic comfort in it, but it is of no good in modern business. Now is the time when we should be busy in the collection of figures and statistics relating to the overseas markets and their analysis with a view to after-the-war trade. We believe that in certain directions the Germans have gone even beyond this. Not only have the facts and figures been thoroughly digested, but they are actually booking orders for delivery after the war!

The British aviation industry has a very live representative body to look after its interests. We mean the Society of British Aircraft Constructors. It is to that body that we must look to initiate the preliminaries. We suggest the immediate formation of a committee by the Society, with the widest possible terms of reference, the business of that body to be the collection of all the available information relating to post-war possibilities, the results of its labours to be at the disposal of all individual members of the trade. But, in conclusion, it is up to everyone to do his share in the trade war when the time comes. It is of no avail that the best and most solid foundations be laid, if the labour to complete the structure is not forthcoming.



LOOPING WITH SMILES IN THE L. AND P. BIPLANE AT HENDON.—What a broadside view from a looping biplane looks like. As each loop is made the horizon line revolves round the centre of vision in a clockwise direction.

The British Air Service

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.

Royal Naval Air Service.

Admiralty, September 26th.

Chief Petty Officer L. F. Creese granted a temporary commission as Sub-Lieut. (R.N.V.R.), seniority Sept. 24th.

Admiralty, September 28th.

Flight-Lieut. G. F. Breese granted acting rank of Flight-Commander, Sept. 25th.

J. W. Eckford granted a temporary commission as Lieut. (R.N.V.R.), seniority Sept. 27th.

T. Terrell, A. W. Dow, H. W. Eades and Petty Officer J. D. Whitelaw granted temporary commissions as Sub-Lieuts. (R.N.V.R.), all seniority Sept. 27th.

E. F. Dixon, R. A. G. Hill and R. H. Catleugh entered as Proby. Flight Officers for temporary service, all date Oct. 1st.

Admiralty, September 29th.

J. H. Hagon, A. C. Baker and J. W. C. Dobbyn granted temporary commissions as Sub-Lieuts. (R.N.V.R.), and appointed to "President" for R.N.A.S., all date Sept. 28th.

Proby. Flight-Sub-Lieut. I. J. Springfield granted a temporary commission as Sub-Lieut. (R.N.V.R.) and appointed to the "President" for R.N.A.S., to date Sept. 28th. Appointment as Proby. Flight-Sub-Lieut. terminated Sept. 27th.

G. Goodhart, A. G. H. Brett, J. F. Nalder, J. E. L. Hunter, S. A. Bowyer and G. B. S. McBain, entered as probationary flight officers, temporary, and appointed to the "President," additional, for R.N.A.S., all date Oct. 1st.

Admiralty, October 2nd.

Flight-Commander C. M. Murphy granted acting rank of Squadron Commander, Sept. 28th.

Temp. Sub-Lieut. J. Weston appointed Temp. Acting Lieut. (R.N.V.R.), Sept. 28th.

Flight-Sub-Lieutenants.—R. Souray, C. V. Arnold, L. H. Wilkins, R. Young, R. M. Clifford, W. L. Graham, J. C. Croft, The Hon. N. G. H. Sturt, C. B. C. Swayne, A. H. Wann, T. W. Elmhirst, T. P. G. Moore, P. E. Maitland, P. G. M. Ommaney, W. Underhill, C. C. R. Edwards, I. C. Little, W. P. C. Chambers and C. W. C. Browne, promoted Flight-Lieuts., seniority Oct. 1st.

Acting Flight-Lieut. D. Gill promoted to Flight-Lieut., seniority Oct. 1st.

Acting Flight-Lieut. (Temp.) B. E. P. Gregg promoted Temp. Flight Lieut., seniority Oct. 1st.

C. W. Bailey, Sept. 1st; A. R. Knight, Aug. 26th; and D. M. Shields, Aug. 22nd, entered as Proby. Flight-Sub-Lieuts. for Temp. service.

Temp. Acting Flight-Lieut. C. O. Smith promoted Flight-Lieut. (Temp.), seniority Oct. 1st; also A. N. Gallehawk.

Flight-Sub-Lieutenants.—C. C. Carlisle, O. A. Butcher, H. E. Crawford, W. H. Sharpe, R. W. Lane, A. E. Hawker, I. H. W. Barnato, W. M. Tait, G. E. Hervey, M. R. Buckland, R. S. D. Q. Quincy, H. G. Travers, H. McClelland, L. A. T. Pritchard, G. A. Gooderham, S. J. Goble, G. Preen, W. R. Mackenzie, C. A. Rea, C. A. Eyre, F. S. McGill, F. E. Sandford, F. N. Halsted, N. Keeble, M. Bartlett, F. D. H. Bremner, A. A. Wallis and C. E. Jamieson promoted to Temp. Flight-Lieuts., seniority Oct. 1st.

Royal Flying Corps (Military Wing).

London Gazette Supplement. September 25th.

Wing Commander.—Capt. (Temporary Major) C. Bovill, R.A., from a Squadron Commander, and to be Temporary Lieutenant-Colonel whilst so employed; Sept. 9th, 1916.

Squadron Commanders.—From Flight-Commanders, and to be Temporary Majors whilst so employed:—Sept. 1st, 1916: Capt. H. Wyllie, Hamps. R. (T.F.); Capt. H. F. Glanville, W.I.R.; Capt. C. G. Bell, Special Reserve; Capt. P. E. L. Gethin, Special Reserve; Lieut. (Temporary Capt.) L. W. Learmount, Special Reserve; Lieut. (Temporary Capt.) B. C. McEwen, Special Reserve.

Flight-Commanders.—Capt. Lord E. A. Grosvenor, Special Reserve; Aug. 28th, 1916. 2nd Lieut. H. G. Dean, York and Lanc. R., from a Flying Officer, and to be Temporary Captain whilst so employed; Aug. 30th, 1916.

Flying Officers.—2nd Lieut. (Temporary Lieut.) H. Hemming, Worc. R., from a Flying Officer (Observer), and to be seconded; Aug. 12th, 1916. (Substituted for the notification in the *Gazette* of Sept. 5th, 1916.) Aug. 23rd, 1916: Temporary 2nd Lieut. S. Nixon, General List; 2nd Lieut. C. C. Clark, R.A., and to be seconded; 2nd Lieut. R. H. S. Slolely, R.A., and to remain seconded; 2nd Lieut. C. C. Morley, Special Reserve. Aug. 30th, 1916: Lieut. C. S. J. Griffin, Gordon Highrs., and to be seconded; 2nd Lieut. (on probation) L. W. Waddell, Essex R., Special Reserve, and to be seconded; 2nd Lieut. T. E. Gorman, Special Reserve. Aug. 31st, 1916: Temporary Lieut. E. L. Williams, E. York R., from a Flying Officer (Observer), with seniority from March 4th, 1916; Temporary 2nd Lieut. A. P. Pycroft, Notts and Derby R., and to be transferred to the General List; 2nd Lieut. R. N. Carter, Dorset R., Special Reserve, and to be seconded; 2nd Lieut. E. C. Stringer, Lond. R. (T.F.) Temporary 2nd Lieut. E. H. Cambridge, General List; Sept. 1st, 1916. Lieut. G. A. Garveys-Gadd, R.F.A., Special Reserve, resigns his appointment on appointment as an Acting Adjutant, R.F.C.; June 22nd, 1916.

Experimental Officer (graded as an Equipment Officer).—Capt. I. O. Griffith, Special Reserve, from an Assistant Equipment Officer; Sept. 1st, 1916.

Assistant Experimental Officer (graded as an Assistant Equipment Officer).—2nd Lieut. (on probation) W. V. Bevon, Special Reserve; Aug. 31st, 1916.

Assistant Equipment Officers.—Sept. 4th, 1916: Temporary 2nd Lieut. W. L. Joseph, attd. Worc. R., and to be transferred to the General List; 2nd Lieut. (on probation) W. E. M. Walker, Special Reserve; Temporary 2nd Lieut. H. L. Woolveridge, General List; Temporary 2nd Lieut. F. W. Ham, General List; 2nd Lieutenants (on probation), Special Reserve: H. W. Sidley, H. S. Counsell, S. P. Stocks; 2nd Lieut. A. S. Cox, Special Reserve; 2nd Lieutenants (on probation), Special Reserve: H. J. Barwick, M. A. Chappell, W. T. Curtis, H. B. Golding, F. E. Hobley, F. M. Howard, J. J. Lovesay; Temporary 2nd Lieut. R. F. McMichael, General List; 2nd Lieutenants (on probation), Special Reserve: E. A. Molyneux, H. W. Robinson, D. Smith, G. H. Warneken, H. G. Welsford and C. H. Butcher.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieutenants (on probation) are confirmed in their rank: A. S. Cox, A. G. Jarvis, J. H. Robertson, G. B. Wilkins. The under-mentioned to be 2nd Lieutenants (on probation): W. Birtwistle; Aug. 14th, 1916. E. E. Cutts; Aug. 26th, 1916. P. V. Baines; Sept. 25th, 1916.

London Gazette, September 26th.

Temporary appointment made at the War Office.:—

Staff Captain.—Temp. 2nd Lieut. (Temp. Capt.) M. K. Cooper-King, Gen. List, from a Flight-Commander, R.F.C., and to retain his temporary rank whilst so employd; Aug. 12th, 1916.

Flight-Commanders.—Lieut. P. B. Prothero, Arg. and Suth'd Highrs., Spec. Res., from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 3rd, 1916. Sept. 12th, 1916: Temp. Capt. N. J. A. L. Prinsep, Gen. List, from a Balloon Officer. From Flying Officers, and to be Temp. Capt. whilst so employed: Temp. Lieut. V. Busby, R.E., Spec. Res.; Lieut. L. T. N. Gould, R.A.; Sept. 14th, 1916.

Flying Officers.—Lieut. G. Alchin, R.F.A., Spec. Res., from a Flying Officer (Ob.); Aug. 29th, 1916, but with seniority from Nov. 22nd, 1915. Aug. 31st, 1916: Lieut. W. S. Scott, Lanc. Fus. (T.F.); 2nd Lieut. F. Hall, Dorset R., and to be secd. Sept. 1st, 1916: Capt. G. C. Pirie, Sco. Rif., Spec. Res., from a Flying Officer (Ob.), with seniority from May 4th, 1916. 2nd Lieut. J. Seabrook, Spec. Res.; Temp. 2nd Lieut. N. L. Robertson, Gen. List, from a Flying Officer (Ob.);

Sept. 2nd, 1916, but with seniority from Feb. 15th, 1916. Sept. 5th, 1916: 2nd Lieut. (on prob.) F. St. J. F. N. Echlin, R. Fus., Spec. Res., from an Assistant Equipment Officer; 2nd Lieut. W. E. Reed, Durh. Fort. Engrs., R.E. (T.F.); Temp. 2nd Lieut. H. D. Addis, Gen. List; Lieut. P. B. Tabernacle, Princess Patricia's Can. L.I.; Sept. 5th, 1916. 2nd Lieut. F. L. Harding, Som. L.I., and to be secd.; Sept. 7th, 1916. 2nd Lieut. (on prob.) B. K. O. Mathews, 3rd North'n. R., Spec. Res., and to be secd.; Sept. 8th, 1916.

Flying Officer (Observer).—The rank of Capt. W. A. Fleming, Devon R., is as now described, and not as in the *Gazette* of Sept. 22nd, 1916.

Assistant Equipment Officers.—2nd Lieut. L. S. Newns, Spec. Res.; May 15th, 1916. 2nd Lieut. G. T. Beer, Devon R. (T.F.); Sept. 4th, 1916.

Memoranda.—To be 2nd Lieuts. for duty with R.F.C.: Sapper C. V. Thornton, from Lond. Elec. Engrs. (T.F.); July 19th, 1916. Pte. S. T. Fradd, from Devon R. (T.F.); Aug. 21st, 1916. Petty Officer D. Armitage, from R.N.A.S.; Sept. 10th, 1916. Temp. Capt. J. S. Curtis, from R. Mar.; Sept. 11th, 1916.

Acting Sergt. A. Wragg, from R.F.C., to be Temp. 2nd Lieut. for duty with the Military Wing of that Corps; Sept. 14th, 1916.

Supplementary to Regular Corps.—2nd Lieuts. (on prob.) confirmed in their rank: M. A. Seymour, J. F. A. Day, W. H. Trinder, G. D. Rae, L. S. Newns, H. W. Sidley, A. J. Winstanley, P. S. Butterworth, S. P. Stocks, D. S. Evans, H. S. Counsell, G. H. Jacob, J. W. Baillie, W. V. Bevon, F. C. Deane, C. H. Bell, A. B. Drewery, P. G. Robinson, R. M. Niell, A. O. K. Wright, J. Seabrook, and G. Barrett. The under-mentioned to be 2nd Lieuts. (on prob.):—Aug. 21st, 1916: G. E. Osmond, M. F. A. Paine, E. F. Cameron, R. W. Mitchell, R. T. Royse, D. B. Thorp, C. R. Fleming-Williams, E. M. A. Van-der-Meersch, W. G. Cooke, T. T. Cumming, H. Whitehead, J. Wheatland-Clinch, J. Goodenough, C. J. W. Hosken, A. W. McAuslane, F. O. Gibbon, J. J. Bartlett, R. E. Chadderton, E. C. McKenzie-Martyn, H. Tallis, H. N. Stradling, R. R. Richards, P. H. S. Gwilliam. M. R. Grover; Aug. 22nd, 1916. G. T. Bridgewater; Sept. 22nd, 1916.

London Gazette Supplement, September 27th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed:—Aug. 1st, 1916: Temp. 2nd Lieut. H. C. Wakefield, Gen. List; 2nd Lieut. H. R. Hawkins, Spec. Res. Capt. C. G. Burge, York and Lanc. R., from a Flying Officer; Sept. 1st, 1916. From Flying Officers, and to be Temp. Capts. whilst so employed:—Sept. 1st, 1916: Lieut. W. W. Higgin, L'pool. R. (T.F.); Lieut. S. T. L. Greer, Lond. Brig., R.F.A. (T.F.); Lieut. C. A. Brooks, Wilts. R., Spec. Res.; Temp. Lieut. G. J. Jones, Gen. List; 2nd Lieut. (Temp. Lieut.) W. Astell, 1st Lovat's Scouts Yeo. (T.F.); 2nd Lieut. O. A. Westendarp, Lond. R. (T.F.); 2nd Lieut. A. C. Wilson, 12th Lrs.; Temp. 2nd Lieut. H. Barker, Gen. List; 2nd Lieut. D. Gilley, Devon. R.; 2nd Lieut. (on prob.) J. O. Archer, R.F.A., Spec. Res.; 2nd Lieut. C. S. Ross, Spec. Res.; Temp. 2nd Lieut. R. J. Lillywhite, Gen. List; 2nd Lieut. W. S. R. Bloomfield, Spec. Res.; Temp. 2nd Lieut. F. M. Ballard, Gen. List. Temp. 2nd Lieut. (Temp. Lieut.) G. A. N. Mitchell, R. Fus., from a Balloon Officer, and to be Temp. Capt. whilst so employed; Sept. 4th, 1916. 2nd Lieut. D. H. Dabbs, Berks Yeo. (T.F.), from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 10th, 1916.

Equipment Officer.—2nd Lieut. G. W. A. Brown, Spec. Res., from an Assistant Equipment Officer, and to be Temp. Capt. whilst so employed; Aug. 19th, 1916.

Flying Officers.—Aug. 28th, 1916: Temp. 2nd Lieut. G. W. Howland, R. Ir. Rif., and to be transfd. to the Gen.

A scene where the Zeppelin raider fell in Essex, showing crowds watching an aeroplane flying over the wrecked airship.

List ; 2nd Lieut. G. D. Rae, Spec. Res. ; 2nd Lieut. A. J. Winstanley, Spec. Res. Aug. 31st, 1916 : 2nd Lieut. D. M. Bisset, Gord. Highrs. (T.F.) ; 2nd Lieut. M. A. Seymour, Spec. Res. ; Temp. 2nd Lieut. C. G. Baker, Gen. List ; 2nd Lieut. G. H. Jacob, Spec. Res. ; 2nd Lieut. J. W. Baillie, Spec. Res. ; 2nd Lieut. P. S. Butterworth, Spec. Res. ; 2nd Lieut. D. S. Evans, Spec. Res. Temp. 2nd Lieut. (on prob.) G. F. Campbell, High. L.I., and to be transfd. to the Gen. List ; Sept. 1st, 1916. Lieut. A. D. Whitehead, R. War. R., and to be secd. ; Sept. 2nd, 1916.

Flying Officer (*Observer*).—Temp. 2nd Lieut. J. B. Hinchcliff, 10th Yorks. L.I., and to be transfd. to the Gen. List ; June 12th, 1916. The appointment of Temp. 2nd Lieut. J. A. Hinchcliffe, Yorks. L.I., as a Flying Officer (Ob.), notified in the *Gazette* on July 7th, 1916, is cancelled. Aug. 30th, 1916 : Temp. Capt. G. Dixon-Spain, R. Fus., and to be transfd. to the Gen. List ; Lieut. R. H. Martin, 18th Can. Inf. Bn. ; 2nd Lieut. H. J. Hamilton, D. of Corn. L.I., and to be secd.

Balloon Officers.—Aug. 12th, 1916 : 2nd Lieuts., Spec. Res. : E. G. Boulenger, and L. S. S. Northcote.

Assistant Equipment Officers.—2nd Lieuts., Spec. Res. : T. Morrison ; July 5th, 1916. Aug. 31st, 1916 : H. H. W. Vowden, H. E. L. Pilbrow, G. A. Lawlor, E. G. Herbert and L. Stones.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C. :—21st Aug., 1916 : 1st Cl. Air-Mech. G. W. Charley, from R.N.A.S. ; Cadet J. M. Mitchell, from 2nd Artists' Rif. O.T.C. ; 2nd Cl. Air-Mech. H. Nankivell, from R.F.C., to be Temp. 2nd Lieut. for duty with the Military Wing of that Corps ; Sept. 13th, 1916.

London Gazette Supplement, September 28th.

The under-mentioned Warrant and N.C.Os. to be 2nd Lieuts. for service in the Field :—

For duty with R.F.C. : Sergt. C. E. Morgan, from R.F.C. ; July 12th, 1916. Pte. J. T. Gibbon, from A.S.C. ; Aug. 15th, 1916. Aug. 17th, 1916 : Sergt. G. Lacey, from R.F.C. ; L.-Sergt. E. M. Henderson, from Lond. R. (T.F.) ; Corpl. J. H. A. Byrne, from R.F.C. ; 2nd Cl. Air-Mech. C. W. O'Neill-Ready, from R.F.C. 1st Cl. Air-Mech. S. Mercer, from R.F.C. ; Aug. 21st, 1916. Sergt. J. E. Macloghlin, from R.F.C. ; Aug. 22nd, 1916. Pte. F. G. Thierry, from Lond. R. (T.F.) ; Aug. 25th, 1916. Sergt. P. C. Hollingsworth, from H.A.C. (T.F.) ; Aug. 26th, 1916. Flight-Sergt. B. E. Hobbs, from R.F.C. ; Aug. 27th, 1916. Aug. 28th, 1916 : Armr.-Sergt. A. E. Godfrey, 1st Can. Pioneer Bn. ; Pte. C. H. P. Ewbank, from Lond. R. (T.F.) ; Sapper W. T. Jourdan, from 2nd Can. Tunnelling Co. ; Aug. 29th, 1916.

Squadron Commander.—Lieut. (Temp. Capt.) J. A. Cunningham, R.A., from a Flight-Commander, and to be Temp. Major whilst so employed ; Sept. 1st, 1916.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed : Lieut. E. W. Farrow, Mach. Gun. Serv., Can. Local Forces ; Sept. 15th, 1916. Temp. 2nd Lieut. E. T. Farrow, Gen. List ; Sept. 18th, 1916. Temp. Lieut. G. B. Hodgson, Gen. List ; Sept. 19th, 1916.

Flying Officers.—Aug. 23rd, 1916 : 2nd Lieut. E. L. French, R. Ir. Rif., Spec. Res., and to be secd. ; 2nd Lieut. O. Nixon, Essex R., and to be secd. ; Temp. 2nd Lieut. A. F. Organ, Gen. List, from a Flying Officer (Ob.), with seniority from April 29th, 1916 ; 2nd Lieut. F. C. Deane, Spec. Res. ; Temp. 2nd Lieut. W. Cochrane, Gen. List ; Temp. 2nd Lieut. F. B. Luget, Gen. List ; 2nd Lieut. R. M. Neill, Spec. Res. ; 2nd Lieut. C. H. Bell, Spec. Res. Temp. 2nd Lieut. I. E. M. Mackenzie, Gen. List ; Aug. 27th, 1916. Lieut. W. R. Gayner, 17th Can. Inf. Bn. ; Aug. 28th, 1916. Lieut. R. S. Brown, Australian F.C. ; Aug. 29th, 1916. 2nd Lieut. G. S. Bozman, R. W. Surr. R. (T.F.) ; Aug. 30th, 1916. Sept. 1st, 1916 : 2nd Lieut. A. P. Davidson, High. L.I., and to be secd. ; 2nd Lieut. D. R. C. Gabell, Glouc. R., and to be secd. ; Sept. 3rd, 1916 : 2nd Lieut. (Temp. Capt.) A. G. Saxty, Som. L.I. (T.F.) ; 2nd Lieut. (Temp. Lieut.) J. M. J. Spencer, Northd. Fus. (T.F.). Temp. Lieut. J. B. Lawton, E. Kent R., and to be transfd. to General List ; Sept. 5th, 1916. Sept. 9th, 1916 : Temp. Lieut. W. G. B. McKechnie, Gen. List, from a Flying Officer (Ob.), with seniority from April 29th, 1916 : Lieut. S. H. Starey, Shrops. L.I., Spec. Res., and to be secd. ; Temp. 2nd Lieut. B. W. Hill, Rif. Brig., and to be transfd. to Gen. List ; Temp. 2nd Lieut. (Temp. Lieut.) I. G. Davies, Gen. List, from a Flying Officer (Ob.), with seniority from Feb. 1st, 1916 : Temp. 2nd Lieut. A. J. Court, Gen. List ; Temp. 2nd Lieut. S. N. Williams, Gen. List ; 2nd Lieut. E. J. Roberts, Spec. Res.

Balloon Officers.—Aug. 28th, 1916 : Capt. V. O. Todd, R. Lanc. R., and to be secd. ; Temp. 2nd Lieut. O. Williams, High. L.I., and to be transfd. to Gen. List ; Temp. 2nd Lieut. S. C. Shepherdson, Welsh R., and to be transfd. to Gen. List ; 2nd Lieut. A. J. Johnston, Spec. Res. ; 2nd Lieut. C. J. R. Milton, Spec. Res. ; 2nd Lieut. C. McM. Russell, Spec. Res. Sept. 11th, 1916 : Capt. W. J. Alexander, Devon R. ; 2nd Lieut. (Temp. Lieut.) A. Law, Arg. and Suth'd. Highrs. (T.F.) ; Temp. Lieut. (2nd Lieut., Welsh Brig., R.F.A. (T.F.)) R. H. N. Lomax, Mach. Gun Corps, and to be transfd. to General List ; Temp. 2nd Lieut. W. A. Dunn, Arg. and Suthd. Highrs., and to be transfd. to Gen. List ; Temp. 2nd Lieut. K. C. Campbell, Bord. R., and to be transfd. to Gen. List ; 2nd Lieut. (on prob.) F. B. B. Shand, Spec. Res.

Adjutants.—Lieut. (Temp. Capt.) B. H. Bonham-Carter, 40th Pathans, Ind. Army ; Sept. 1st, 1916. Capt. H. C. C. Morley, E. Kent R., and to be secd., vice Capt. J. A. M. Lang, Notts and Derby R. ; Aug. 27th, 1916.

Brigade Commander and to be Temporary Brigadier-General while so employed.—Brevet Major C. A. H. Longcroft, Welsh R., from Temp. Lieut.-Col. and Wing Commander, R.F.C. ; Aug. 28th, 1916.

Staff Captains.—Aug. 27th, 1916 : Capt. J. A. M. Lang, Notts and Derby R., from Adjutant, R.F.C. ; Lieut. (Temp. Capt.) R. H. Jerman, R.W. Fus., from Adjutant, R.F.C., and to retain his temporary rank whilst so employed, vice Capt. H. N. Walker, Welsh R.

Memoranda.—The under-mentioned to be Temp. Lieuts. :—Sept. 29th, 1916 : 2nd Lieut. W. G. Stewart, R.F.C., Spec. Res., from a Flying Officer ; Sergt. J. W. Matthews, from a Divisional Sig. Co., R.E. ; Cadet W. J. King, from Cadet School O.T.C., M.T., A.S.C., to be Temp. 2nd Lieut. for duty with R.F.C. ; Sept. 6th, 1916.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank : E. J. Roberts, C. McM. Russell, C. J. R. Milton, A. J. Johnston, G. L. Bond, H. F. Chapman, R. S. Jameson. The under-mentioned to be 2nd Lieuts. : R. J. Cowan ; July 9th, 1916. Aug. 14th, 1916 : R. A. Hassard, C. H. Boyle. The under-mentioned to be 2nd Lieuts. (on probation) : P. R. Hutchinson ; Aug. 19th, 1916. A. C. Smith ; Aug. 21st, 1916.

London Gazette Supplement, October 2nd.

Flight Commanders.—And to be Temp. Capts. whilst so employed :—Sept. 15th, 1916 : Temp. Lieut. J. B. Quested, Gen. List, from a Flying Officer ; 2nd Lieut. (on prob.) B. H. Sisson, R.G.A., Spec. Res., from a Balloon Officer ; 2nd Lieut. A. M. Vaucour, R.A., from a Flying Officer. 2nd Lieut. (Temp. Lieut.) T. L. Purdom, K.O.Sco. Bord. (T.F.), from a Flying Officer ; Sept. 20th, 1916.

Flying Officers.—Lieut. (now Capt.) R. B. Bourdillon, Spec. Res., from an Assistant Equipment Officer, from May 15th to June 8th, 1916. Temp. Lieut. F. O. Troup, R. Innis. Fus., and to be transfd. to Gen. List ; Aug. 29th, 1916. Sept. 7th, 1916 : 2nd Lieut. (Temp. Capt.) A. G. Deuchar, Northern Cyclist Bn. (T.F.) ; Lieut. E. M. Lugard, R. Lanc. R., and to be secd. ; Lieut. A. Ferris, R. Ir. Rif., Spec. Res., and to be secd. ; Temp. 2nd Lieut. (on prob.) G. D. Buckeridge, K.R. Rif. C., and to be transfd. to Gen. List. Sept. 8th, 1916 : Temp. 2nd Lieut. M. A. E. Cremetti, R. Sc. Fus., and to be transfd. to Gen. List ; 2nd Lieut. G. W. Gillespie, Middx. R. (T.F.) ; 2nd Lieut. H. F. Evans, Berks. R. Horse Art. (T.F.). Sept. 9th, 1916 : 2nd Lieut. D. W. Forshaw, Brecknockshire Bn., S. Wales Bord. (T.F.) ; 2nd Lieut. J. W. D. Leigh, Northern Cyclist Bn. (T.F.) ; 2nd Lieut. F. G. Parsons, Spec. Res. Temp. Lieut. A. Duguid, Gen. List, from a Flying Officer (Ob.) ; Sept. 10th, 1916, but with seniority as from Feb. 17th, 1916.

Balloon Officers.—Aug. 28th, 1916 : Temp. Capt. B. White, High. L.I., and to be transfd. to Gen. List ; 2nd Lieut. (Temp. Capt.) W. Wallace, Northumbrian Brig., R.F.A. (T.F.) ; Temp. Lieut. L. D. A. Dircks, Lond. R. (T.F.) ; Temp. Lieut. R. M. Plummer, Bedf. R. (T.F.) ; Temp. Lieut. R. P. Sewell, Essex R., and to be transfd. to Gen. List ; Lieut. N. R. Mossop, Suff. R., Spec. Res., and to be secd. ; Temp. 2nd Lieut. F. S. Wallis, R. War. R., and to be transfd. to Gen. List ; 2nd Lieut. (on prob.) D. P. Farrant, R. Fus., Spec. Res., and to be secd. ; 2nd Lieut. G. L. Bond, Spec. Res. ; Temp. 2nd Lieut. P. J. Scales, Hamps. R., and to be transfd. to Gen. List ; 2nd Lieut. H. F. Chapman, Spec. Res. ; 2nd Lieut. R. S. Jameson, Spec. Res.

Adjutants.—Capt. G. B. Fraser, 2nd Regt. King Edward's Horse, Spec. Res., and to be secd.; Aug. 12th, 1916. Temp. 2nd Lieut. (Temp. Lieut.) G. R. Moser, Arg. and Suthd. Highrs., from a Flying Officer (Ob.); Sept. 18th, 1916.

Assistant Equipment Officers.—2nd Lieut. H. I. Bell, 3rd Co. of Lond. Yeo. (T.F.); Aug. 25th, 1916. Temp. 2nd Lieut. P. M. H. Currie, Gen. List; Sept. 1st, 1916. 2nd Lieut. (on prob.) G. L. Main, Spec. Res.; Sept. 9th, 1916. Sept. 10th, 1916: 2nd Lieut. (Temp. Capt.) W. T. Taylor, 12th N. Lan. R. (T.F.); Temp. 2nd Lieut. A. D. Goodwin, Gen. List. Sept. 11th, 1916: Temp. 2nd Lieut. H. J. Brambley, Worc. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) L. C. Atwool, Rif. Brig., and to be transfd. to Gen. List; Temp. 2nd Lieut. P. P. Capelli, Gen. List; 2nd Lieut. (on prob.) C. W. Barnsley, Spec. Res.; 2nd Lieut. (on prob.) J. J. Bartlett, Spec. Res.; 2nd Lieut. (on prob.) R. E. Chadderton, Spec. Res.; Temp. 2nd Lieut. G. W. Charley, Gen. List; 2nd Lieut. (on prob.) R. W. Mitchell, Spec. Res.; Temp. 2nd Lieut. F. A. Cobb, R.A., and to be transfd. to General List; 2nd Lieuts. (on prob.), Spec. Res.: D. L. Hollis, W. G. Cooke, C. R. Fleming-Williams, F. O. Gibbon, J. Goodenough, M. R. Grover, P. H. S. Gwilliam, C. J. W. Hosken, A. W. McAuslane, H. Whitehead; Temp. 2nd Lieut. A. B. Wiggin, Gen. List; 2nd Lieuts. (on prob.), Spec. Res.: T. A. B. Rolfe, E. C. McKenzie-Martyn; Temp. 2nd Lieut. J. M. Mitchell, Gen. List; 2nd Lieuts (on prob.), Spec. Res.: G. E. Osmond, M. F. A. Paine, R. R. Richards, R. T. Royse, A. C. Smith, H. N. Stradling, H. Tallis, D. B. Thorp, E. M. A. Van der Meersch, J. Wheatland-Clinch, A. E. Squire.

Memorandum.—Lieut. A. B. Wiggin, from a Cadet Bn., R. War. R., to be Temp. 2nd Lieut. for duty with R.F.C.; Aug. 21st, 1916.

Supplementary to Regular Corps.—The under-mentioned resign their commissions: Lieut. (Temp. Capt.) W. H. Furlonger, 2nd Lieut. (on prob.) A. Brown, 2nd Lieut. A. Goulding (on account of ill-health), all Oct. 3rd, 1916.

THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

Accidentally Killed.

Proby. Flight-Sub-Lieut. P. S. Kennedy, R.N.
Flight-Sub-Lieut. J. D. Scott, R.N.

Previously reported Missing, now reported Killed.

Acting Flight-Com. G. H. Beard, D.S.C., R.N.

Died of Injuries.

2nd Grade Air Craftsman O. B. Langford.

Injured.

Flight-Lieut. Norman W. G. Blackburn, R.N.
Proby. Flight-Sub-Lieut. E. L. Lister, R.N.
Lieut. R. G. St. John, R.N.V.R.

Accidentally Injured.

Proby. Flight-Sub-Lieut. R. A. Campbell, R.N.

Slightly Injured.

Flight-Lieut. E. Cadbury, R.N.
Proby. Flight Sub-Lieut. S. E. G. Lees, R.N.

Slightly Wounded.

P.O. Mech. J. J. McGladrigan, Armoured Car Div., R.N.A.S.
P.O. Mech. A. Rodwell, Armoured Car Div., R.N.A.S.

Reported by the War Office:—

Killed.

Lieut. C. W. Hardman, Middlesex, attd. R.F.C.
Second Lieut. C. D. Higgins, R.F.C.
Second Lieut. L. V. Morgan, Buffs. (E. Kent) and R.F.C.
Second Lieut. P. S. Osmaston, R. Sussex, attd. R.F.C.
8864 2nd Air Mech. R. Anderson, R.F.C.

Died of Wounds.

Lieut. G. G. Bentley, R.F.C.
Second Lieut. F. Hall, Dorset, attd. R.F.C.
Second Lieut. P. J. Smyth, Connaught Ran., attd. R.F.C.

Wounded.

Second Lieut. C. Baines, York and Lanc., attd. R.F.C.
Lieut. J. A. R. Buller, R.F.C.
Second Lieut. A. J. Cathie, R.F.C.
Second Lieut. L. F. Forbes, R.F.C.
Second Lieut. A. R. Walker, Seaforth H., attd. R.F.C.
4258 1st Air Mech. H. W. Woodcock, R.F.C.

Missing.

Second Lieut. R. N. Carter, Dorset R., attd. R.F.C.
Second Lieut. G. Edwards, R.F.C.
Second Lieut. R. H. Edwards, R.F.C.
Second Lieut. O. O. Godfrey, R.F.C.
Second Lieut. W. J. Gray, R.F.C.
Second Lieut. G. Hedderwick, Dragoon Gds., attd. R.F.C.
Second Lieut. R. D. Herman, S. Lancs. and R.F.C.
Second Lieut. F. A. A. Hewson, Border, attd. R.F.C.
Second Lieut. K. F. Hunt, Yeomanry and R.F.C.
Lieut. J. M. J. Kenny, A.S.C. and R.F.C.
Second Lieut. E. J. Roberts, R.F.C.
Second Lieut. J. L. Tibbetts, R.F.C.
Captain H. C. Tower, R.F.C.
Lieut. W. G. Warn, R. Sussex and R.F.C.
Second Lieut. T. West, R.E. and R.F.C.
Second Lieut. E. H. Wingfield, R.F.C.
1565 Flight-Sergt. N. S. Clarkson, R.F.C.
2260 Sergt. A. Walker, R.F.C.

Previously reported Missing, now reported Prisoner of War in German Hands.

Second Lieut. C. W. Blain, R.F.C.

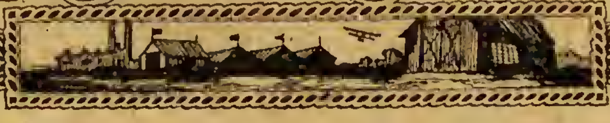
Correction:

Missing.

Second Lieut. C. Elphinstone, R.F.C., should read Elphinston.

* * *

From the British Flying Grounds



Grahame-White School, Hendon.

STRAIGHTS with instructor last week: Messrs. Norris and Culver. Circuits with instructor: Messrs. Lord, Kaizer, Rogers. Ranson, Steeves, Whiteman, Green, Wood, Travers, Robertson, Sutherland, Cockell, Edwards, Sanders, Styles, Fisher and Zambournis.

Brevet taken by Mr. Bathurst.

Instructors: Messrs. Manton, Winter, Pashley, Biard and Hale.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Ross and Allen. Doing straights alone: Mr. Burry. Half circuits alone: Messrs. Davies and Holland. Figures of eight and circuits alone: Mr. Montgomery.

Instructors: Messrs. S. Summerfield, E. Bryníldsen and H. Smith.

35, 45 and 60 h.p. Caudrons in use.

SUGGESTED SIGNALLING DEVICE FOR INTER-COMMUNICATION BETWEEN AEROPLANES.

While it is undeniable that great strides have been made in the application of wireless telegraphy to aircraft, the fact nevertheless remains that the transmitting apparatus, if it is to have a sufficiently long radius of action to render it of any great practical value, must of necessity be comparatively heavy, a fact which is of no slight importance, especially on long-distance flights over enemy country, where every ounce counts. In addition to the disadvantage presented by the weight of the installation, receiving wireless messages on board an aeroplane is rendered difficult by the noise of the engine. Add to these drawbacks the effect of several transmitters working simultaneously, either on board a number of one's own machines or, as is well known in naval warfare, from the enemy's transmitters in an endeavour to "jam" the instruments of the opposing forces, and it will be realised that the lot of an aeral wireless operator is not an enviable one. A few moments' thought will make it obvious that under certain conditions some of which we have enumerated above, the wireless is not an ideal means of communication, especially over short distances, where some form of visual signalling, necessitating the carrying of only a small fraction of the weight of that of a wireless set, might be employed with advantage.

Several forms of visual signalling have been tried from time to time with varying success, such as the firing of coloured rockets from large pistols, Morse signals sent by means of flash lamps, and other methods for use at night, and heliographic apparatus and smoke signals for use in the daytime. The last two mentioned, however, suffer, as is well known, from many inherent drawbacks.

What appears to us to be a very promising device, designed chiefly for intercommunication between the units of an aeroplane squadron in flight, has been suggested and submitted to us by an officer, who is also the inventor of a highly interesting apparatus for the safe landing of aeroplanes at night. Our illustrations will help to show the general principle of this signalling apparatus.

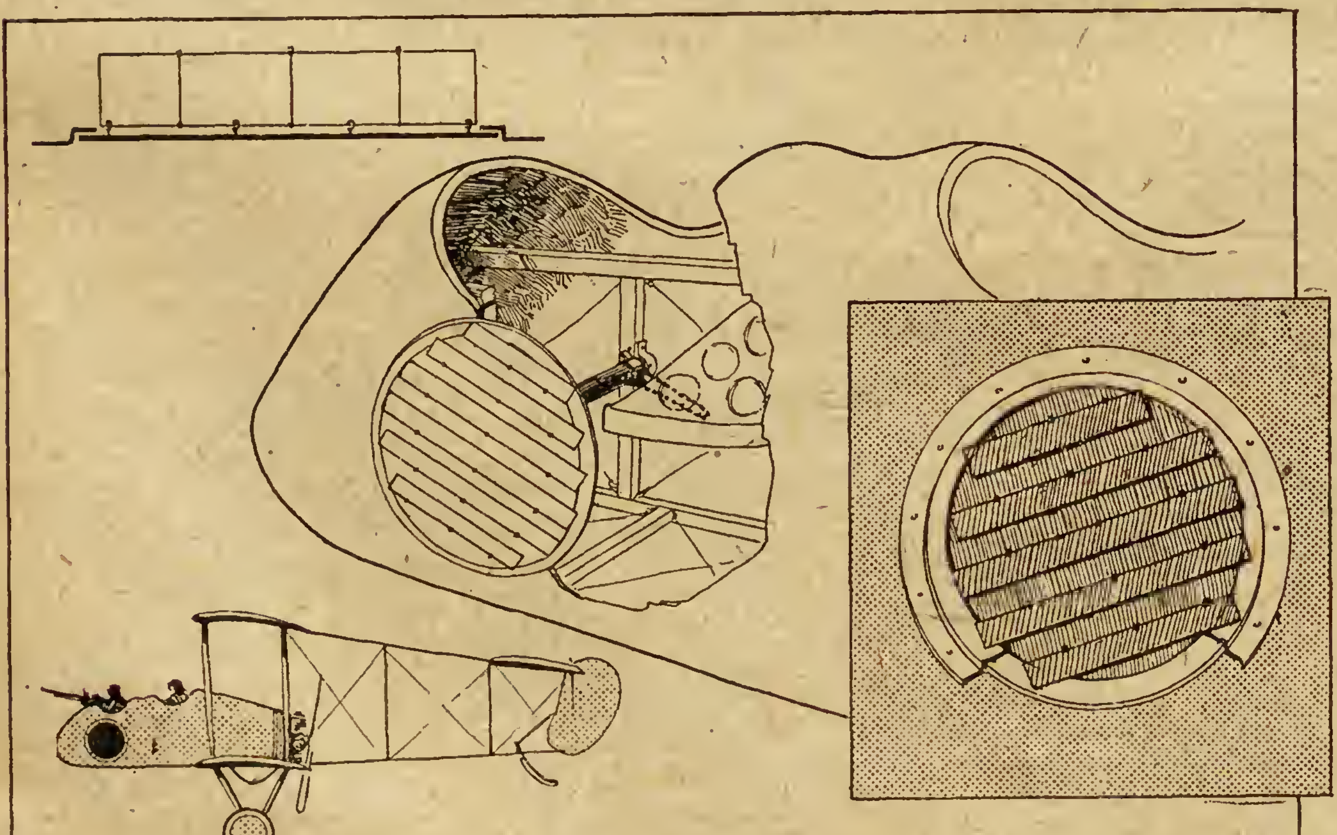
Fundamentally, the instrument consists of two oscillating discs mounted on a transverse rod, which is, in turn, carried in suitable bearings on the framework of the body of the aeroplane. The two discs lie flat against the sides of the body, and their edges are prevented by outer flanges, which are attached to the body, from being blown out from the sides. On these discs are mounted a number of flaps made of fabric stiffened by steel wire or similar material. Each strip is hinged to the circular disc and is painted black on one side and white on the other, and the discs themselves are painted to correspond in such a manner that when the narrow flaps, which would have a depth of about 1½ inches to 2 inches, lie against the discs in one direction, the whole disc will show white, while when the flaps are turned with their other side outwards the whole disc will show black. In order that the wind may act on the flaps quickly, the flaps should be prevented from lying flat against the discs by, for instance, suitable projecting studs on the discs. The transverse rod would be provided at some convenient point, for instance, just in front of and below the observer's seat, with a short lever by means of which the shaft could be rocked backwards and forwards, suitable stops being provided to limit the movement in either direction.

Normally the flaps would be at an inclination to the line of flight of the machine, and kept against the discs by the pressure of the air. When the discs are moved by means of the rod until the flaps form an angle with the line of flight in the opposite direction, the flaps would turn over, thus exposing their other side.

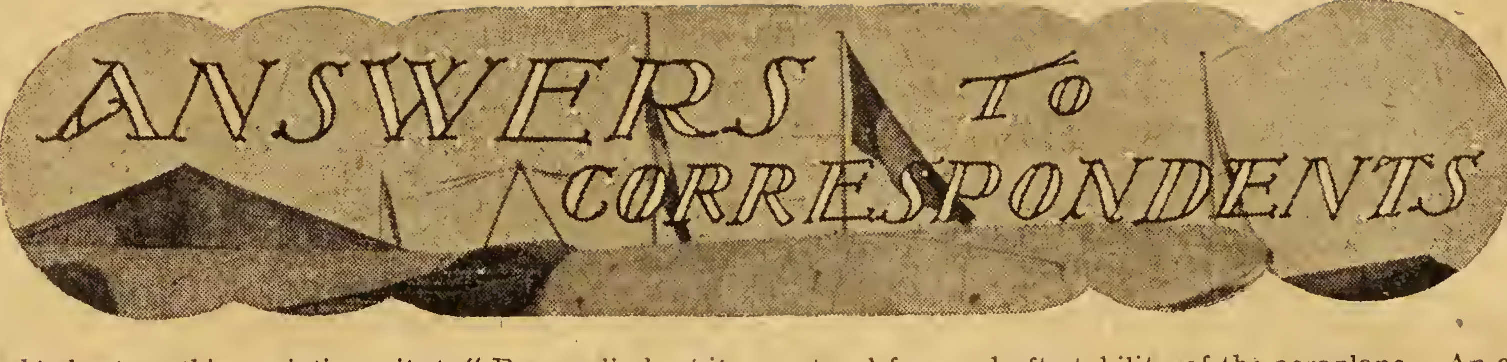
The whole arrangement could be built very lightly, and it appears to us that some such form of signalling would be most useful for conveying orders from the commander of a squadron or flight of aeroplanes to the various units. As these discs could be made of approximately 2 ft. in diameter, signals could probably be read at a horizontal distance of some 1,500 ft. or more, according to climatic conditions, while the rate of sending should be somewhere in the neighbourhood of six words a minute. If a combination of code letters be used this rate could be considerably increased.

In addition to communication between the units of a squadron several other uses to which this apparatus might be put suggest themselves. For instance, by this means the pilot of a seaplane, by coming down to a low altitude, could signal any message by means of the ordinary Morse code, which the captain of any vessel is able to read. Also an aeroplane travelling across country could send messages to aerodromes in passing without having to come down.

The mechanical details of the device are so simple that there does not seem to be any likelihood of it going wrong, and the weight is so small as to allow installation in any type of aeroplane without regard to the particular class of work this has to do. A simple code could easily be arranged to contain all necessary messages likely to be wanted, which any pilot could learn to use with ease. The advantages appear to us too obvious to need further elaboration here. Experiments, we understand, have been made in wind currents of velocities of from 40 to 60 miles per hour with very satisfactory results, which unmistakably demonstrates its practical efficiency.



Diagrammatic sketch showing the arrangement of the device described in the accompanying article.



ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatic, write to " Flight " *about it.*

[As a number of letters have reached us lately which were signed with initials only, and some of which did not give a complete address, we should like to point out that such communications cannot be dealt with in our columns. Full name and address should always be given, and will not be published.—Ed.]

S. M. T. (Margate).

You might be able to enter the R.N.A.S. as a boy mechanic. Write to the R.N.A.S. recruiting office, Brook Green, Hammersmith, S.W. Wireless operators should write either to the Wireless Officer, R.F.C., Regent Street Polytechnic, S.W., or to the Wireless Officer, R.N.A.S., Talbot Works, Barlby Road, Kensington, W.

C. B. (Middlesbrough).

Apply to the Secretary of the Admiralty for the necessary forms and send in your application to the Director of Air Services, Admiralty, S.W. While a Probationary Flight Officer you will receive 10*s*. a day, with a further 4*s*. a day for Flying Risk while you are learning to fly. You will get a grant of £15 towards the cost of your kit, and a further £20 for khaki if ordered abroad.

D. W. B. C. (Sussex Gardens).

When the late Gustav Hamel did his famous " apple turnover," although *apparently* his machine kept a straight course, it could hardly have done so strictly speaking, if by straight course you mean a rectilinear horizontal flight path. It is more probable that the flight path was curved downwards, but so slightly as to be imperceptible. As to the reasons why the machine did not side-slip on the portion of the turn-over when the wings were vertical, this was in all probability due to the relation between the momentum of the machine and the time taken to complete the turn-over.

H. C. B. (King's Lynn).

When a machine of weight W glides down a path forming an angle α with the horizontal at a velocity V, if it is allowed to strike the ground at its gliding angle—that is to say, without flattening out—the kinetic energy to be absorbed by the undercarriage $= \frac{W \cdot V^2}{2g} \sin.^2 \alpha$, or, if the gliding angle be expressed as 1 in x, the kinetic energy to be absorbed by the chassis $= \frac{W}{2g}\left(\frac{V}{x}\right)^2$. It is impossible to state definitely what elevator movement is required to maintain horizontal flight at the various angles of incidence, as this varies according to the type of machine. Theoretically it should be possible, by pulling the elevator up sufficiently, to cause an aeroplane to fly at angles of incidence greater than that corresponding to maximum lift, but in practice it would be a very tricky performance, since " reversal of controls " would then come in. That is to say, in order to increase the lift the control lever would have to be pushed forward, and for decreasing the lift the tail would be dropped. In looping the loop the elevator is pulled up to such an extent as to overcome the natural fore and aft stability of the aeroplane. An approximate estimate of the lift and drift coefficients of a non-lifting tail plane and elevator for various angles of incidence of either may be made by treating these surfaces as flat planes of this plan form, and using the coefficients for a flat plane, due allowance being made for aspect ratio. We have no particulars of the Voisin section to which you refer. The information regarding the tests made at the N.P.L. is contained in the annual reports of the Advisory Committee for Aeronautics for the years 1911–12 and 1912–13. The price is 11*s*. and 10*s*. respectively. The latter results have not been published on account of the war.

G. H. (Dunstable).

In the advertisements of " Flight " you will find addresses of patent agents who would attend to the patenting of your invention. A provisional patent costs, we believe, about £1, and protects your invention for one year.

H. J. W. (Goodmayes).

In the " Answers to Correspondents " column of our issue of September 7th we published a graph of the path followed by bombs when dropped from various altitudes and translational speeds. The weight of the bomb is not included in the calculations, as these took no account of air resistance. To make allowance for the effects of a head wind or a following wind, it is only necessary to add or subtract the velocity of the wind from the velocity of the machine. Thus, if the speed of the machine is 80 m.p.h. and the following wind 20 m.p.h., the ground speed will be 100 m.p.h. If the machine is flying against the wind and the velocities are the same as before, the ground speed will be 60 m.p.h. So far as we are aware, there is no reliable instrument on the market indicating the ground speed of an aeroplane.

H. G. B. (Dartmouth).

During the war no description of military aeroplanes is permitted, and we cannot therefore tell you the differences between the two machines you mention. For the same reason we are unable to answer your second question regarding which is the fastest machine going.

S. E. H. (1st A.-M.).

The resistance of an aeroplane is obtained by adding together the resistance of its component parts. It is generally divided into two parts, the resistance of the wings and the body resistance. The latter includes the resistance of the body, plane struts, wiring, tail planes, undercarriage, in short all other resistance than that of the wings themselves. The resistance of the wings depends on the area, aspect ratio, biplane spacing, and section employed. At present the only way of estimating the lift and resistance of a certain wing section is from results obtained in wind tunnel experiments, and the lift and resistance coefficients vary greatly according to the section. The resistance of bodies, struts, wires, wheels, &c., is determined in the same way from model experiments, and varies according to shape. No general formula can be given.

* * *

Rewards for Zepp. Wreckers.

It was officially announced on Wednesday that the King has been graciously pleased to appoint the under-mentioned officers Companions of the Distinguished Service Order in recognition of their gallantry and distinguished service in connection with the successful attack on enemy airships :

Second Lieutenant Frederick Sowrey, Royal Fusiliers, attached R.F.C.

Second Lieutenant Alfred de Bath Brandon, M.C., R.F.C., Special Reserve.

Fatal Accidents.

On the afternoon of September 29th Sergt. F. Keyle and 1st Class Air-Mechanic H. Clancy, of the Royal Flying Corps, were killed through the fall of an aeroplane piloted by Sergt. Keyle.

Capt. R. K. Shives, R.F.C., was killed in a gun accident in Norfolk on September 30th.

As a military aeroplane was nearing an aerodrome on Sunday morning it fell and was completely wrecked. The passenger was instantly killed, and the pilot severely injured.

ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS.

SPECIAL COMMITTEE MEETING.

A Special Meeting of the Committee was held on Monday, the 2nd inst., when there were present: Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight Commander C. F. Pollock, R.N., and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Second Lieut. Henry Dansey Addis (8th Seaforth Highlanders).

Flight Sub-Lieut. Sydney Harold Lionel Douglas-Crompton, R.N.

Charles George Lane.

Michel Nentsky.

Lewis Pennington.

New Club Premises.

The negotiations for the New Club Premises have now been completed.

The House selected by the Committee is **No. 3, CLIFFORD STREET**, New Bond Street, W., which is centrally situated and within three minutes' walk of the present premises.

It is hoped that the House will be opened to Members before the end of the year.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Sept. 27th, 1916	10,851	16	3
Collected at the Westland Aircraft Works, Yeovil (Fiftieth contribution)	0	11	10
Miss Gertrude Pitt	1	1	0
Received from the Publishers of *Aerial Russia* ..	0	2	6
Total, October 3rd, 1916	10,853	11	7

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

THE "X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 50" Raid, September 25th–26th.

German Version.

Berlin, September 26th.

"On the night of September 25th–26th a section of our naval airships lavishly bombarded with explosive and incendiary bombs, with visible good results, the British naval port of Portsmouth, the 'reinforced' places at the mouth of the Thames, and industrial and railway installations of military importance in Central England, including York, Leeds, Lincoln and Derby. In spite of strong enemy attacks, our airships returned undamaged."

"X 51" Raid, October 1st–2nd.

The following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief the Home Forces:—

October 1st, 11.45 *p.m.*

"A number of hostile airships crossed the East Coast between 9 p.m. and midnight. A few bombs have been dropped near the coast, but no damage has yet been reported. The raid is still in progress, and some airships are in the vicinity of London, where some guns have been in action. An airship is just reported to have been brought down in flames North of London."

October 2nd, 10.30 *a.m.*

"Ten hostile airships crossed the East Coast last night between 9 o'clock and midnight.

"One airship approached the North of London about 10 p.m., but was driven off by gunfire and pursued by aeroplanes. She attempted to return from the north-west, but was attacked by guns and aeroplanes and brought to earth in flames in the neighbourhood of Potters Bar shortly before midnight.

"A second airship attempted to attack London from the north-east, but was driven off about 1 a.m. A number of bombs were dropped, but no reports of casualties or damage have yet been received.

"The remaining airships wandered aimlessly over the Eastern Counties and Lincolnshire. Bombs were dropped promiscuously, but most of them appear to have dropped in the open country without doing any damage.

"The airship destroyed was of the latest type."

3.30 *p.m.*

"Police reports show that the total casualties as a result of last night's raid were one man killed and one woman injured.

"The material damage was insignificant, although the raiders covered a wide area and dropped a great number of bombs.

"Four houses were seriously damaged, some glasshouses were demolished, and a number of windows were broken."

German Version.

Berlin, October 2nd.

"During the night of October 2nd several naval airships successfully dropped bombs on London and military works on the Humber. Despite the heavy firing by anti-aircraft guns, all the airships returned except one, which was shot and set on fire by anti-aircraft guns and fell to earth near London."

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New Regulations Against Souvenir Hunters.

By Order in Council the following new regulation has been made under the Defence of the Realm Act:—

"If any person, having found any bomb or projectile, or any fragment thereof, or any document, map, or other article whatsoever which he has reasonable grounds for believing or suspecting to have been discharged, dropped, or lost from, or to have been carried in or to have formed part of any aircraft or vessel of the enemy, or to have formed part of the equipment or personal effects of any member of the crew of such aircraft or vessel, without lawful authority or excuse neglects forthwith, after finding the same, or, in the case of any such article which was found before October 3rd, 1916, as soon as may be after that date, to communicate the fact to a military post or to a police-constable in the neighbourhood, or on being so required, neglects to send or deliver the same to the competent naval or military authority or some person authorised by him for the purpose, he shall be guilty of an offence against these regulations.

"Where any such article is found at the place where the aircraft in question or the wreck thereof descended, no person shall, without lawful excuse, displace, remove, or otherwise interfere with such article, and, if any person does so, he shall be guilty of an offence against these regulations."

Armchair Reflections

by the "Dreamer"

There comes a time when I get tired of things. I know a man who, what time the raiders were busy dropping messengers of death from the clouds on a Saturday night round about his house and mine, was on the flat of his back with the influenza fiend racking his limbs and prodding his brain until it throbbed and throbbed again.

He lay in bed but faintly interested, having the news brought to him periodically with the soda and milk. It was nothing to him that the Tower Bridge was being demolished for the fifth time, or that London was once more but a heap of smouldering ruins. He lay in bed comfortably warm; I, donning my greatcoat over night attire, paced the garden in slippers.

To-day he is getting better. There is a comforting fire in his study. The most luxurious armchair has been wheeled to the cosiest corner away from the draught. Female hands wait upon his every wish. He is King in his domain. Only when he is really ill does a man come into his own. Let him be but getting ill, and they will dose him with ammoniated quinine and faintly-veiled remarks illustrative of how he has brought it all upon himself by not dressing properly for the occasion. Undoubtedly the best thing to do when the gasbags come is to lie in bed and let them go hang.

There comes a time when I get tired of things. All Saturday night I stayed away from my bed to catch cold in the garden, and all Monday night I stayed up making it worse, and because my cold has arrived one day behind the fair, the heroic possibilities of the situation are lost to me. Not for me is the luxurious armchair and the cool hand to my fevered brow, but the ammoniated stuff and the tallow candle and the words without soothing cadence.

There comes a time when I get tired of things, and I am tired now of Zepp. raidings. If they do not cease quickly, they will lose me all my friends. Like meddling with other people's business, it is a thing you are better out of, for the greatest damage done by the raiders is the host of broken friendships that follow in their wake, owing to differences of opinion. Each raid has cost me dearly in lost friendships. Following a night of bomb-dropping, my friends fall away from me like the leaves from the Virginia creeper in autumn. This time, in a moment of unguardedness, I have severed the friendship of years because I ventured to disbelieve a man who told me in all sober earnestness that he saw a trapdoor open in the under part of the Zepp. and a bomb drop through.

In the early days I lost many friends who, although living widely apart, had the airship stationary right over their respective houses, but I became wise to this trap and was not caught later. I came near to losing several in previous raids who saw "the whole thing shiver as the shots struck it," and who "saw her point her nose vertically to climb out of range," but the affair was patched up by a compromise, and I should have taken heed of my tongue. But I was not prepared for the trapdoor being seen to open and a bomb slip through with the machine at something like twenty thousand feet above our heads.

A weak point in my composition is that I cannot lie low and say nothing when things do not seem to me to point to possibilities. There is that correspondent whose tale is in the dailies this week, for instance. If he were a friend of mine, I am sure that friendship would be in jeopardy. He gives a graphic account of the saving of an aeroplane by the observer after the pilot was killed. The communication cord had also been shot through. I do not know exactly what, by that name, the communication cord in an aeroplane is, but we will take it for granted that there is one. The machine dived vertically towards the ground, and all seemed about to end in a pile-up, when, at 200 yards from *terra firma*, the heroic observer wriggled out of his seat and got upon the top plane, thus restoring the balance. From this position of control he worked the rudder with his hand. The machine rapidly assumed its proper flying aspect, and came safely to earth within friendly lines. And because the writer is unknown to me, my visiting list is unaffected so far as he is concerned.

Two years ago I had never seen a Zeppelin. Since then I have seen most of those that have approached my district, including the three which dropped, finished up in flame and smoke, and I have been inclined to tell of what I have seen, but now I come to realise it, I find that people have received my statements without respectful reserve, even as I have received those of others. I am inclined to the belief that there is a kind of disease, a sort of zeppelinitis, that sets the hand of all men against his brothers, and that the best recipe is to have influenza and stay in bed out of the way of everything, and to see and say nothing.

There are times when I get tired of things, and I am tired putting forward my opinions against those of others. In future, I intend to pretend to believe everything I am told in relation to airship raids.

◆ ◆

The Exhibition of Zepp. Relics.

To the exhibition at the H.A.C. grounds in Finsbury of relics of the German airship brought down at Cuffley has now been added another marquee containing several parts of one of the Zeppelins brought down in Essex. About 12 feet of the pointed end of the airship is shown, together with two engines, one of the engine cabins, the bomb-dropping gear, propellers, gears, tanks, &c. Another instructive addition is an L.V.G. biplane captured in France.

◆ ◆

How Italy does it.

It has been announced in Rome that the valuable property of the Austrian Imperial family owned in Italy is to be sold, and the proceeds of the sale devoted to the payment of compensation to sufferers in towns bombarded by Austrian aircraft. It is estimated that the property, for which tenders have already been received, is worth anything from fifty to a hundred million lire (£2,000,000 to £4,000,000).

AIRISMS FROM THE FOUR WINDS.

THREE, CLIFFORD STREET, New Bond Street.

– – –

THREE minutes from 166, Piccadilly.

– – –

FIRST turning, right, in New Bond Street.

– – –

Now you all know where the new Club House of the Royal Aero Club is situated. It will probably be open to members before Christmas.

– – –

PROSPECTIVE members should join up without delay. Do it now.

– – –

DOWN this term for hearing in the King's Bench Division:—
"P.B." *v.* Business Newspapers, Ltd.
Palmer *v.* ditto.

– – –

HAPPENED last week on the following from the *Kolnische Volkszeitung*:—

"The recent mysterious stoppage of shipping traffic with England is attributed to the following. It appears the English have been successful in building a number of new airships of a semi-rigid type. The number is not great, but their usefulness is proved. There was a coast protection manœuvre held on a great scale for the whole of the English air-fleet. In order to keep secret the number and kind of airships the English harbours were completely closed."

It should be noted the information is attributed to a neutral source.

– – –

COUNT ZEPPELIN is reported to be ill at Stuttgart. Is this a first stage in his recent solemn vow to destroy, in a great raid, the King's palace and the principal structures of London —or die? By the seven and ten airship contingents visiting us recently, it looks as if he is keeping in cotton wool the 80 Zepps. which he claims to have ready for the job. He should hurry up with his great coup, or he may find some of our surprises will considerably modify his powers of strafing by dirigibles.

– – –

RECENTLY we noted a suggestion that the wire and other "bric-à-brac" from the Cuffley Zepp. wreckage should, in the form of souvenirs, be the means of bringing funds into the coffers of the Red Cross Society. The idea commended itself to the W.O., and a few tons of the remains have been handed over, and give promise of a splendid harvest on "Our Day," October 19th.

Three, Clifford Street, New Bond Street, the new Club House of the Royal Aero Club. The building faces towards Piccadilly.

– – –

BUT *might* not these have been conserved for sale quite independently of "Our Day"? Zepp. relics combined with so good a cause as the Red Cross should ensure ready disposal of ever so many tons of such a genuine memento of the first airship down on English soil, whilst it would be a mean curmudgeon indeed who would not give of his best on "Our Day" without special inducement of tangible return. Perhaps Miss Beeman may find it's not too late even now to arrange so as to secure the double harvest.

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THE *Daily Chronicle* "Office Window" chat is ever entertaining and quaint. Zepp. souvenir—*real genuine*—hunters may well ponder the following "by the way":—

"Some while ago I drew attention to the wealth lying unheeded in the streets in the shape of bolts, nuts, screws and various other fittings shed by 'buses and motor cars and embedded in the wood blocks. Nobody seems to have thought it worth while to excavate there—until last Sunday. Then, all along the streets in the suburban area where the Zepps. had passed scores of folks were to be seen, all day long, digging up the derelict scraps of metal under the fond delusion that they were remnants of bombs or shrapnel."

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IF further proof positive were required of the innate barbarism of the German nation, it is to be found in their word strafing of our "Tanks" surprise. "SCHUETZENGRABEN-DREADNOUGHTS" is how the *Berliner Tageblatt* puts it. Enough to scare our caterpillars clean out of action.

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A STRONGLY supported deputation to the Prime Minister upon the De Keyser Hotel ramp is under way. It is to be hoped that the entire principle will be the point put forward, not merely the case on behalf of those concerned in this particular case.

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EDMONTON District Council last week ruled from the Chair with a piece of a Zepp. bomb, in substitution for the orthodox Chairman's hammer.

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MR. LLOYD GEORGE is ever politic and is a great dissembler. Like the chameleon, he can adapt himself to his surroundings, judging by the following paragraph in the recent interview which our War Minister granted the President of the United Press of America:—

"The Secretary for War, who looks and acts and talks more like an American business man than any other Englishman in public life, was now 'speaking real United States.' There was scarcely a trace of the usual British intonation or accent in his voice."

Perhaps he put on a Welsh brogue.

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Apropos our article on the control of mechanical operations by whistling. Dr. A. M. Low, the eminent consulting engineer, writes: "It might interest you to know that I had several doors in my laboratory some years ago which could be opened by whistling a certain note to them. Needless to say the same principle can be applied to any mechanical operation, but it is not in the ordinary way of great value for mechanical and other reasons."

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A RECENT contribution received by the Lord Mayor for the Lord Kitchener Memorial Fund is £100 from the British and Colonial Aeroplane Co., Ltd., the makers of the Bristol aeroplanes.

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THROUGH the efforts of the Overseas Club aeroplanes have recently been presented to the Imperial Aircraft Flotilla from the Chiefs and people of Kwahu District, Gold Coast; Residents of Queenstown, South Africa; Residents of Shanghai; Imperial Order Daughters of the British Empire, U.S.A.; British residents in Hankow; Residents of Auckland, N.Z. This makes 74 aeroplanes which have been given through the Club.

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IN addition four machines, each costing £2,700, have been given by donors in New South Wales to form part of the Australian Air Squadron.

JUST IN TIME.—Even the Zepp. raids have had their humours. In a certain suburb a tramcar had been derailed by a bomb, and among the onlookers who gathered was a seedy Hebrew. "Have the police taken particulars yet?" he asked, and was answered in the negative. "And haven't any insurance people taken the names of the injured in this tram?" Again the answer was "No." "Vell, den," he said excitedly, "move up a bit inside and make room for me."—*London Opinion.*

* * *

THE daily *communiqués* show that during September 53 German machines were destroyed by the British, while 47 at least were driven down damaged. The French claim that 100 German machines were brought down by machines or gunners, while six others were forced to land. The Germans claim that they have accounted for 116 enemy machines. The loss of 48 British machines is admitted.

* * *

IT is stated that the rays from the 1,280,000,000 candle-power Sperry searchlight set on fire a heap of rubbish situated some 200 ft. away. Seems as if that Zepp.-strafing device, the ultra-vêriot rays, propounded by "FLIGHT'S" tame inventor October 22nd last, is going to materialise.

* * *

THIS searchlight is the invention of Elmer A. Sperry, of gyroscopic stabiliser fame, and will, it is claimed, when mounted near sea level, render a vessel as it appears on the horizon clearly distinguishable. Some searchlight!

* * *

BERLIN was stunned by the news that we had bagged two Zeppelins. Britain also voted it "stunning."

* * *

A HAM was found in the fallen Zeppelin. A Hun-eatable souvenir, but the soldiers on guard ate it.—*Whipped Topics.*

* * *

THERE does not at first appear to be much connection between mines and aeroplanes, yet it seems that the latter's sphere of usefulness has actually been extended to mine operating. The California Aeroplane Co. is maintaining an aeroplane service over a distance of 14 miles to the Dolly Varden Mine in the Alice Arm district of British Columbia. The aeroplane makes two trips daily carrying supplies to Dolly, and returning with ore for Alice. This service, it is stated, has been the means of preventing the shutting down of Dolly Varden.

* * *

F. BJORKLUND, who used to put up quite a lot of flying at Hendon on his Blériot early in 1914, is instructing several enthusiastic New Yorkers at the aviation camp which has been established on Governors Island by some public-spirited patriots with a view to supplying pilots to the Aerial Reserve Corps.

* * *

IT appears to be a quaint idea to get up a public fund with the object of presenting silver watches to the six special constables who were concerned in arresting the crew of the Zepp. which came down near the Essex Coast. So far as we have been able to ascertain, there was no special trench work required—in fact, the men seem to have been mighty glad to give themselves up.

* * *

FROM Aberdeen comes the suggestion that a Royal Flying Corps of Women should be forthwith inaugurated, with the main object of supplying the necessary air patrols for the coasts of Britain, and thus release our pilots for other objectives. "L. E. W." is responsible for this suggested innovation, which, however, we hardly think will find over much favour with those "up above," in spite of the correspondent's —he or she—arguments. After—he or she—asserting that "the young women contemporaries of the young men killed will for the most part—unless polygamy becomes a British institution — remain husbandless and homeless," the originator of this brain-wave continues as follows: "Their sex does not protect women from Zeppelin attacks. Why then should it prevent them from defending themselves and others by justifiable means? Women have often been urged to take up work for which they are not physically or mentally fitted. But there can be nothing harmful to their constitution or degrading to their dignity in conquering the air and defending their country. Risks there will be, but women have proved from time immemorial that they are no cowards, and for them, too, what better death than 'Pro Patria'? 25,000—1,000,000!—could be provided if women were enlisted in a Flying Corps!"

So long as a million is assured, no need to worry. We could wait for the full complement of the Corps.

TEN YEARS AGO.

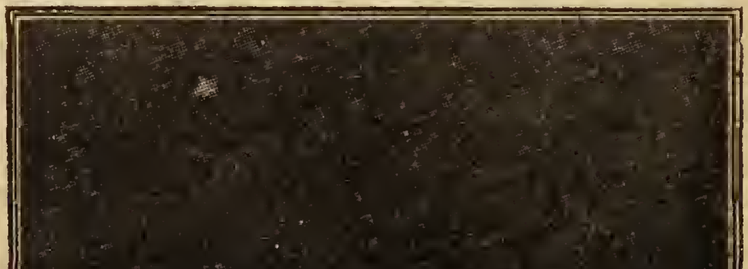
Excerpts from the "Auto." ("FLIGHT'S" *precursor and sister Journal*) *of September 29th,* 1906. "FLIGHT" *was founded in* 1908.

THE GORDON-BENNETT BALLOON RACE.

The Gordon-Bennett Balloon Race is to start on the 30th of the present month, and England will be very effectively represented by Mr. F. H. Butler in the enormous "City of London," the Hon. C. S. Rolls in the "Britannia," and Professor Huntington in the "Zephyr." All the leading countries of Europe, in fact, will be represented by participants.

THE SANTOS DUMONT MOTOR BALLOON.

M. Santos Dumont has been for some time experimenting with lifting propellers driven by a petrol motor, as a means of diminishing the amount of ballast that requires to be carried in the car of an ordinary spherical balloon. He is using this principle in the balloon with which he will compete in the Gordon-Bennett Race. The car is fitted with a motor, a framework of bicycle tubing, and with two horizontal propellers which are driven by propeller shafts and bevel gearing. The petrol tank, which is on the other side of the car, serves to counterbalance the weight of the motor. When the balloon is in equilibrium it can be caused to rise or fall as much as required by the action of the propellers, so that the necessity for losing gas or ballast is diminished.



"THE BEST LAID SCHEMES 'O' MICE AND MEN.'—The above photograph of the Potters Bar Zeppelin, alight from end to end, was the first of an intended series of photographs taken on one plate at 10-second intervals to show progress. In the middle of the second exposure, however, a crowd of enthusiastic cheerers carried camera and tripod by the board, with the result seen, in the lower photo., in the mixed-up image of the Zepp.

"THE AEROPLANE OF TO-MORROW."

VARIABLE SURFACE AND STABILITY.

By LOUIS DE BAZILLAC, Engineer (École Supérieure d'Aéronautique de Paris).

Translated by B. BRUCE-WALKER, B.Sc.

In our issues of September 4th et seq., 1914, we published a series of interesting articles by Mons. de Bazillac, in which the author showed how an aeroplane that can increase its lifting surface possesses considerable reserve of lift, speed variation and safety from nose-diving. We are glad to be able to commence this week another article by Mons. de Bazillac, in which he deals with the effect of a variable surface on stability.—ED.

Longitudinal Stability.

In what follows it will be shown that a system of variable surface possesses a considerable reserve of automatic longitudinal stability if the shape of the variable surface can be automatically altered.

Let us give the name of "central couple" to the resultant moment of all the forces acting on the machine about the centre of gravity. We will suppose that the thrust of the propeller passes through the centre of gravity, and consider the machine as provided with a tail and having movements parallel to its plane of symmetry.

Let:

R_1, R_2 be the pressures of the air on the whole machine and on the tail, and

L_1, L_2 the distances of R_1, R_2 from the centre of gravity.

The central couple is given (Fig. 1) by:

$$\Gamma = R_1 L_1 - R_2 L_2 \qquad (1)$$

When the machine deviates from its normal attitude, if the central couple tends to bring it back, this couple plays the part of a restoring couple, and it is this that assures the stability of the machine.

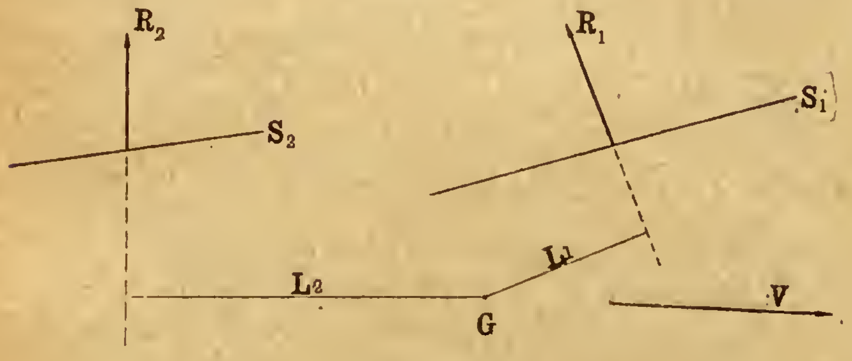


Fig. 1.

Denote by:

V	the instantaneous velocity of the machine;
S_1	the main surface;
K_1	a coefficient characteristic of this surface;
α_1	the angle of normal flight;
S_2	the surface of the tail;
K_2	a coefficient characteristic of this surface;
$(\alpha_1 \pm \epsilon)$	the angle of the tail with the direction of the speed.

(The + sign refers to the case in which the angle ϵ is situated above S_2, and the − sign to the case in which it is situated below.)

We can write as a first approximation and for small variations of the angle of attack:

$$R_1 = K_1 S_1 V^2 \alpha_1 \qquad (2)$$

$$R_2 = K_2 S_2 V^2 (\alpha_1 + \epsilon) \qquad (3)$$

When the normal condition is established the central couple is zero, and we have:

$$R_1 L_1 - R_2 L_2 = 0 \qquad (4)$$

Consider the variations of this couple starting from its zero value for infinitely small deviations. Expression (1) gives:

$$\begin{aligned}\delta\Gamma &= (R_1 + \delta R_1)(L_1 + \delta L_1) - (R_2 + \delta R_2)(L_2 + \delta L_2) \\ &= L_1 \delta R_1 + R_1 \delta L_1 + R_1 L_1 + \delta R_1 \delta L_1 \\ &- (L_2 \delta R_2 + R_2 \delta L_2 + R_2 L_2 + \delta R_2 \delta L_2),\end{aligned}$$

whence, taking (4) into account and neglecting the second order of small quantities:

$$\delta\Gamma = L_1 \delta R_1 - L_2 \delta R_2 + (R_1 \delta L_1 - R_2 \delta L_2) \qquad (5)$$

We may calculate the order of magnitude of these last two moments. For this consider the ratio

$$\frac{R_1 \delta L_1}{L_2 \delta R_2}.$$

Denoting by N_1 a coefficient which relates to the displacements in position and direction of R_1, we can write:

$$L_1 = N_1 \alpha_1;$$

and the above ratio becomes:

$$\frac{R_1 \delta L_1}{L_2 \delta R_2} = \frac{K_1 S_1 V^2 N_1 \alpha_1 \delta\alpha_1}{K_2 S_2 V^2 L_2 \delta\alpha_1} = \frac{N_1}{L_2} \cdot \frac{\alpha_1}{K_2 S_2 / K_1 S_1},$$

whence, putting $\frac{K_2 S_2}{K_1 S_1} = \rho$,

$$\frac{R_1 \delta L_1}{L_2 \delta R_2} = \frac{N_1}{L_2} \cdot \frac{\alpha_1}{\rho}.$$

In the majority of existing flying machines α_1 and ρ are of the same order of magnitude. When the surface of the tail is increased the ratio α_1/ρ can only be diminished thereby. The order of magnitude of the ratio α_1/ρ is, therefore, no greater than unity. As far as the ratio N_1/L_2 is concerned it is easy to see that it is hardly of the order of a hundredth, for N_1 is generally at the most a few centimetres, whereas L_2 is always several metres. In short, we see that the ratio of the moments $R_1 \delta L_1$ and $L_2 \delta R_2$ will be at the most of the order of a hundredth, and that consequently in a first approximation the moment $R_1 \delta L_1$ is perfectly negligible compared to $L_2 \delta R_2$.

With still greater reason is $R_2 \delta L_2$ negligible compared to the moment $L_2 \delta R_2$, for δL_2 and δL_1 are of the same order of magnitude, and R_2 is generally smaller than R_1.

We see then that in a first approximation perfectly compatible with the whole of our considerations we can neglect the bracketed quantity $(R_1 \delta L_1 - R_2 \delta L_2)$. We can then write with sufficient accuracy:

$$\delta\Gamma = L_1 \delta R_1 - L_2 \delta R_2,$$

and, taking (4) into account:

$$\delta\Gamma = L_2 R_2 \frac{\delta R_1}{R_1} - L_2 \delta R_2.$$

Finally, substituting for R_1, R_2, δR_1, δR_2, their values obtained from (2) and (3):

$$\delta\Gamma = L_2 \rho K_1 S_1 V^2 \left(\frac{\epsilon}{\alpha_1}\right) \delta\alpha_1, = L_2 R_2 \frac{\epsilon}{\alpha_1(\alpha_1 + \epsilon)} \delta\alpha_1 \qquad (6)$$

$$\text{or } \delta\Gamma = \pm (L_1 K_1 S_1 - L_2 K_2 S_2) V^2 \delta\alpha_1 \qquad (7)$$

(The + sign refers to the case in which the rear surface is lifting and the − sign to the case in which it is non-lifting.)

Suppose further that the surfaces S_1 or S_2 can be automatically increased or decreased under the influence of the gust.

The resistance of the air to the machine not remaining constant, the speed will vary during the disturbance. Can this variation in speed be neglected?

Let:

γ be the inclination of the velocity during a glide with the engine off (Fig. 2),

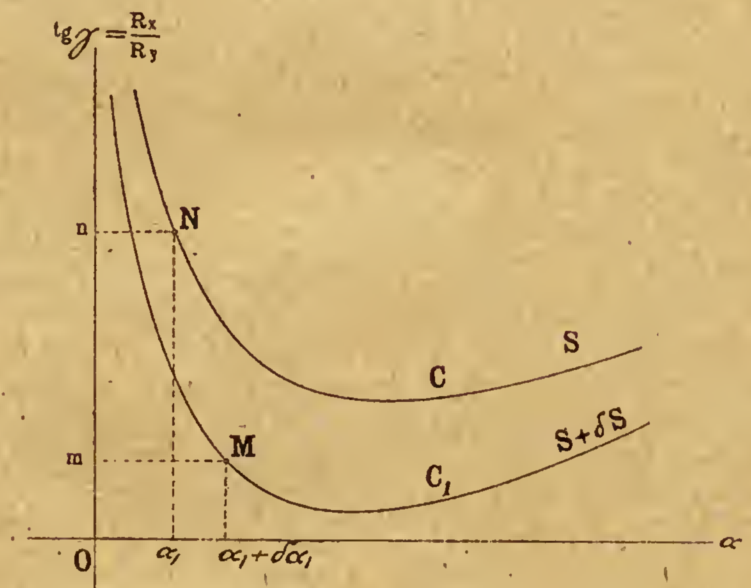


Fig. 2.

C and C_1 the curves of the inclinations γ relating to the surfaces S and S + δ S, and

V_{α_1} and $V_{\alpha_1 + \delta\alpha_1}$ the speeds corresponding to the angles α_1 and $\alpha_1 + \delta\alpha_1$.

At the angle α_1 the propulsive force per unit weight was *o n*.

At the angle $\alpha_1 + \delta\alpha_1$ the propulsive force necessary for horizontal flight has become *o m*.

Since the thrust of the propeller has remained constant the difference of force *m n* makes the machine climb and measures its slope of ascent δi, or

$$\delta i = \tan^{-1} mn.$$

We have therefore:

$$\left(\frac{V_{\alpha_1} + \delta\alpha_1}{V_{\alpha_1}}\right)^2 = \cos \delta i.$$

At the same time the variation of the angle of attack $\delta\alpha_1$ through which the machine has passed at the end of the time δt has diminished. It has become at the end of this time:

$$d\alpha_1 = \delta\alpha_1 - \delta i,$$

for the inclination of the machine to the horizontal has remained the same.

For this variation of the angle of attack the value of the central couple has become:

$$d\Gamma = \delta\,\Gamma\left(\frac{V_{\alpha_1} + \delta\alpha_1}{V_{\alpha_1}}\right)^2 \cdot \frac{d\alpha_1}{\delta\alpha_1 - \delta i}$$

$$= \delta\,\Gamma \cos \delta i \left(\frac{1}{1 - \frac{\delta i}{\delta\alpha_1}}\right).$$

So that the variation of the speed acquired under the influence of the disturbance might be neglected it was necessary for δi to be practically *nil;* it was consequently necessary to increase the angle α_1 to the minimum of the curve C_1 or to decrease *m n*, that is to say, H/W, W being the weight of the machine, and H the pull of the propeller. We would thus come to the question of means, whether an automatic regulation of the conditions of carburation of the engine or an automatic adjustment of the weights; which does not at all amount to saying, in spite of the erroneous theories of some writers, that to decrease *m n* it suffices once and for all to increase W. The aeroplane cannot be rendered stable by its design alone. It can only become so by an automatic alteration of this design during a disturbance.

However that may be, it can be seen that the variation of the speed, $V\delta\alpha_1$, during the infinitely small interval of time δt, will be in practice, having regard to the inertia of the masses, so slight beside the speed $V\alpha_1$, as to be negligible in a first approximation; and we may regard the speed V as remaining sensibly constant during the whole of the disturbance.

Under these conditions, if we return to expression (7) for the variation of the central couple, we see that the variation of this couple enhances the stability during the disturbance, whether with a non-lifting tail we increase S_1 or decrease S_2, or whether with a lifting tail we increase S_2 or decrease S_1, or if we increase S_2 with $(\alpha_1 + \epsilon)$ varying alone and α_1 remaining constant.

In this last case the central couple of the machine reduces to the single couple of the surface S_2, and we have:

$$\delta\,\Gamma \doteq L_2 K_2 S_2 V^2 \delta(\alpha_1 + \epsilon) = \frac{L_2 R_2}{(\alpha_1 + \epsilon)} \delta(\alpha_1 + \epsilon) \qquad (8)$$

In order to render the angle of attack α_1 constant, we can imagine a forward surface S_1 freely movable about an axis C normal to the plane of symmetry of the machine (Fig. 3).

This surface is fitted in such a way that during the longitudinal oscillations of the machine it always retains an invariable incidence with regard to the relative wind. It is for this purpose furnished with a little tail 9 9, which with S_1 constitutes a rigid structure.

The displacements of this tail are magnified, and transmitted to the rear surface by a suitable mechanism.

In this manner the machine travels in calm air with reduced surface at the angle of normal flight. It resists disturbances by automatically increasing its rear surface.

Formula (8) shows that an aeroplane of which the incidence of the forward plane to the relative wind remains invariable possesses by virtue of this fact a central couple that is generally large. (A simple calculation would prove that it is practically a maximum for $S_1 = S_2$ when the tail is lifting.)

We see, further, that if the rear surface can also be doubled for a given value of $\delta(\alpha_1 + \epsilon)$ the value of the central couple is increased in about the same proportion. We thus pass automatically from a couple that is already great with an invariable surface to a couple of double the size when the surface is enlarged. A couple of 100 kilog-metres thus becomes 200 kilog-metres. The movable arrangement proposed for this enlargement can, moreover, be employed in the case of a non-lifting tail as a forward surface for diminishing the rear surface.

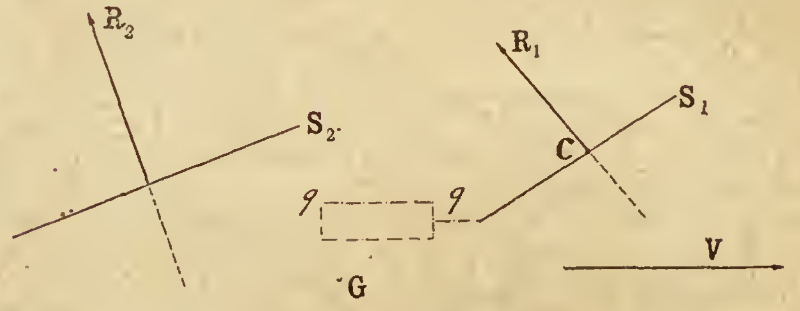


Fig. 3.

The gain that it is possible to obtain in the value of the central couple by variation of surface is indeed remarkable. It constitutes for the machine a very powerful reserve of automatic longitudinal stability and for the necessities of practice one of the most convenient and perhaps the most efficacious of the methods of stabilisation advocated up till now. Everything seems to show that a machine of which the design could be automatically modified during a disturbance would gain greatly from the point of view of safety in flight, and that it would actually be rendered almost completely stable.

(*To be concluded*).

ALLIED AIRCRAFT CAPTURED BY THE GERMANS.

From time to time official *communiqués* are published in the German Press giving particulars of British and other Allied aircraft which they claim to have captured on the Western Front.

The following is the list for the month of July:—

British Aircraft.

1. Caudron biplane, No. 2235, Sergt. Lesire, Mechanic Coat.
2. B.E. biplane, No. 4196, Lieut. Wingfield, 12th Wing.
3. B.E. biplane, No. 2763, Capt. Chaloner, 12th Wing.
4. B.E. biplane, No. 2648, Lieut. Monckton.
5. F.E. biplane, No. 6365, Lieut. John Hackett Firstbroock, Lieut. Burgess.
6. B.E. biplane, No. 7338, Second Lieut. C. H. A. Coxe, 2nd Wing.
7. Vickers biplane, No. ?, motor W.D. 1350, Lieut. Owen Tudor Hart, Capt. G. Webbs.
8. Avro biplane, No. 2640, Cornelius van Hosterland, 12th Wing.
9. Vickers biplane, No. 6357, Lieut. Toone, Lieut. Harvey.
10. B.E. plane, No. 949, Lieut. W. Baxter Ellis, 2nd Wing.
11. Bristol biplane, No. 5746, Second Lieut. Haward.
12. Morane monoplane, 833 A. 175, Major J. J. Waldron, 60th Squadron.
13. B.E. biplane, No. 4073, Lieut. W. J. Castle, 13th Squadron.
14. Bristol biplane, No. ?, Lieut. J. L. Whitty, Capt. D. N. Veitch, 70th Squadron.
15. B.E. biplane, No. 5765, Lieut. Eric Jovett, Corpl. Johnston, 4th Squadron.
16. B.E. biplane, No. 2192, Lieut. Hewson.
17. Macfarlande, No. 7301, Lieut. R. W. Nichol.
18. F.E. biplane, No. 6952, Second Lieut. D. H. Macintyre, Second Lieut. H. Floyd.
19. Vickers biplane, No. 6949, motor A.I.D.W. 423/6979, occupants burnt.
20. Vickers biplane, No. 6011, Lieut. Kerr.
21. F.E. biplane, No. 5233, Lieut. Butterworth, Lieut. MacEwen, 18th Squadron.
22. Sopwith biplane, No. 9653, Lieut. Hele-Shaw.
23. Bristol biplane, No. 7333, First Lieut. H. Clements Finnerty, 12th Wing.
24. Morane-Saulnier biplane, No. ?, Capt. H. G. Evans, First Lieut. H. O. Long.
25. Morane monoplane, No. ?, motor burnt, Lieut. Peterson (American, killed).
26. Bristol biplane, No. 2100, Lieut. R. M. Wilson (? Wilson Brower), 70th Squadron.
27. Martinsyde biplane, No. 7471, Lieut. Graham, 27th Squadron.
28. Martinsyde biplane, No. 4704, Lieut. E. R. Farmer, 27th Squadron.

A similar detailed list is also published of 20 French biplanes, making altogether, says the Berlin *communiqué*, 48 aircraft, as opposed to six German aircraft left in the enemy's hands.

Personals

Casualties.

Lieutenant C. E. N. **Cooper**, Lincolnshire Regiment, attached R.F.C., who fell on September 16th, in his twenty-sixth year, was the eldest son of Mr. and Mrs. Geo. C. Nooth Cooper, of South Norwood. He was educated at the Whitgift Grammar School, Croydon, and after six years' service in the Mercantile Marine, he obtained an appointment with Messrs. Geo. Cradock and Co., wire rope makers, of Wakefield, Yorks. He enlisted in the Queen Victoria Rifles in October, 1914, and obtained his commission in the Lincolnshire Regiment, Special Reserve, in February, 1915. In April, 1915, he was sent to the Front and served there with his regiment until about three months ago, when he was lent to the Royal Flying Corps as a balloon observation officer. His death was caused by his parachute failing to act when compelled by an accident to descend from his balloon.

Second Lieutenant **Frederick St. John Ford North Echlin**, Royal Fusiliers and R.F.C., was killed in action on September 26th. He was in the Malay States on the outbreak of war, and came home and volunteered for service. He was gazetted to the Royal Fusiliers and afterwards transferred to the Royal Flying Corps, quickly gaining his pilot's certificate. In March last he married the daughter of Major Saumarez Dorbée, of Ronceval, Guernsey, and granddaughter of the Dean of Guernsey.

Lieutenant J. **Hugh Gale**, R.F.C., who was reported missing, it is now announced has been killed at the Front. He was educated at Marlborough and Hertford College, Oxford, and was the only son of Mr. and Mrs. John Gale, Cuddesdon, Oxon.

Lieutenant C. W. **Hardman**, R.F.C., who has been killed while flying at the Front, was 28 years of age, and was the only son of Mr. and Mrs. Hardman, of Bengeo, Hertford Road, East Finchley. He was educated at East Finchley Grammar School and Christ College, Finchley. Before the war he held an appointment at Clerkenwell County Court, but left it to join the Seaforth Highlanders. After eight months' training he obtained a commission in the Middlesex Regiment. He went to the Front about five months ago, and was given the position of trench mortar commander to the battalion. Lieutenant Hardman was transferred to the Royal Flying Corps only about a fortnight ago.

Second Lieutenant **Claude D. Higgins**, R.F.C., who was killed on September 22nd, was the younger son of Mr. and Mrs. F. W. Higgins, of Chittagong. He obtained his pilot's certificate in August, 1916, and went to the Front a few days later. He had returned from India in the spring after having fulfilled his contract with Messrs. Hearty and Gresham, engineers, of Calcutta.

Second Lieutenant **Victor Richard Humphreys**, Royal Berkshire Regiment, who was killed on September 25th, in his nineteenth year, was the second son of Mr. and Mrs. Richard Humphreys, of Dunallan, Mill Lane, West Hampstead. He was on the eve of being transferred to the Royal Flying Corps. He was educated at the Haberdashers' Company's School, Cricklewood, and joined the Public Schools Brigade in September, 1914, from which he obtained a commission and was gazetted to the Royal Berkshire Regiment in May, 1915. He went to the Front in April, 1916.

Lieutenant **Ian Cameron Macdonell**, R.F.C., reported missing on July 2nd, with Lieutenant Williamson, his observing officer, is now reported to have been killed in action on that date, his aeroplane being shot down. He was the only surviving son of Brigadier-General A. C. Macdonell, C.M.G., D.S.O., commanding a Canadian Infantry Brigade, and Mrs. A. C. Macdonell. Born in Lethbridge, Alberta, in 1895, he was educated at Winnipeg, Manitoba. He obtained his brevet from the Royal Aero Club as a pilot in December, 1913, after passing through the Bristol School of Flying at Brooklands. Soon after the outbreak of war he was gazetted a Lieutenant in his father's regiment, Lord Strathcona's Horse. In March, 1915, he became A.D.C. to Brigadier-General J. E. B. Seely, C.B., D.S.O., commanding the Canadian Cavalry Brigade, and served with them in the trenches, including the battle of Festubert, till he became attached, on probation, to the Royal Flying Corps in September, 1915. He was gazetted Flying Officer on November 6th of the same year. He met with a serious accident through the failure of his engine in December, 1915. His observer was killed, and he himself more or less seriously injured. He reported for duty with the Royal Flying Corps on May 18th, 1916. He was a grandson of Lieutenant-Colonel J. T. Campbell, a Crimean veteran, and his father belonged to a Cadet family of the Macdonells of Glengarry, who have given so many officers to the Empire.

Second Lieutenant **John Morton Mansel-Pleydell**, Royal Field Artillery (died of wounds on September 22nd), aged 32, was elder twin son of Canon Mansel-Pleydell, lately Vicar of Sturminster Newton, Dorset. He was co-inventor of a very important improvement in anti-aircraft gunnery. He was educated at Winchester and Trinity College, Cambridge, graduating in the Classical Tripos (second in Class II). He returned from the Malay in September, 1914, and obtained a commission in the R.F.A. the following December, and went to the Front in August, 1915. He died of wounds received in action on September 22nd.

Captain **Kenneth Algernon Brooke Murray**, A.S.C., attached R.F.C., whose death is announced, was the only son of Major Brooke Murray, late Indian Army, of 7, Painswick Lawn, Cheltenham. He was in his twenty-fifth year. He was educated at Cheltenham College, 1906–10, and was in the college Bisley teams in 1908, 1909 and 1910. He entered Sandhurst in September, 1910, and was gazetted to the Army Service Corps in 1911. He proceeded to France in August, 1914, and took part in all the operations from Mons to the Marne and Aisne, Ypres and Armentières. He served as Adjutant of the Advanced Horse Transport Depôt from April to July, 1915; as Staff Captain, G.H.Q., July to October, 1915; as Embarkation Officer at Marseilles, November, 1915, to April, 1916, and at Divisional Ammunition Park, April to June, 1916, when he was attached to the Royal Flying Corps as a Flying Officer Observer. He died on September 23rd of wounds received in an air fight against three enemy aviators on September 16th.

Lieutenant **Philip Ryland Pinsent**, R.F.C., reported killed, was educated at Horris Hill and Winchester. He obtained a commission in the Royal Flying Corps in April, and went to the Front early in July. He was severely wounded in an air fight on September 23rd, and died on September 24th, the eve of his nineteenth birthday. He was the youngest son of Mr. and Mrs. R. A. Pinsent, of Selly Wick, Birmingham.

Second Lieutenant **Michael H. F. Thunder**, of the R.F.C., who died at Norwich from burns received in a flying accident, was buried at Ramsgate on September 29th with military honours. He was the son of the late Mr. George Thunder, of Lagore, Meath, and grandson, on his mother's side, of Pugin, the architect. He was educated at St. Augustine's College, Ramsgate; he had his commission in December, 1915, and was gazetted flying officer in March of this year. Six officers of the Flying Corps acted as bearers, and the officer in command arrived by aeroplane.

Captain **Hugh Christopher Tower**, Flight-Commander R.F.C. (officially reported missing, but believed to have been killed in air combat in France on September 19th), aged 30, was the only surviving son of Christopher J. H. Tower and Mrs. Tower, Wealdside, Essex. Educated at Sir Anthony Browne's School, Brentwood, and abroad, he passed the Surveyors' Institute examination and was sub-agent on the estates of Lady Heytesbury and the late Sir Edmund Antrobus in Wiltshire. On the outbreak of war he volunteered for Special Reserve, R.F.C., and joined at Farnborough on August 15th, 1914. He was flying in France from April, 1915, until he returned to England on promotion to Flight-Commander on November 1st, 1915. After six months' work in England, Captain Tower resumed his duties at the Front last May, where his skill and fearless bravery were well known. His elder brother, Lieutenant Christopher C. Tower, Essex Yeomanry, A.D.C., 12th Division, was killed in action on October 2nd, 1915. Captain Tower was at Sir Anthony Browne's School from 1898 to 1902.

Married and to be Married.

The engagement is announced of Major Alexander Cleghorn, R.F.C., elder son of Mr. and Mrs. Alexander Cleghorn, 14, Hatfield Drive, Glasgow, and Morag, daughter of Professor and Mrs. Archibald Barr, Westerton-of-Mugdock, Milngavie, Stirlingshire.

A marriage will shortly take place between Flight-Sub-Lieutenant Cecil Henry FitzHerbert, R.N.A.S., youngest son of Mr. and Mrs. Henry Corry FitzHerbert, of Abbeyleix, Ireland, and Ellen Katharine (Kitty), eldest daughter of Mr. and Mrs. Walter Lowndes, of Broomfield, Hoylake, Cheshire.

Captain John Sowrey, R.F.C., eldest son of Mr. J. W. Sowrey, Yeovency Lodge, Staines, was on September 16th married at Hythe (Kent) Parish Church to Miss Sibyl Audrey Adam, youngest daughter of the late Dr. James Adam, of Malling Place, West Malling, and Mrs. Adam, Quarry Down, Hythe. A feature of the event was a visit of aeroplanes by brother officers of the bridegroom, and during the ceremony they gave an exhibition of flying over the church and town, looping the loop, spirals, &c.

Items.

The will has been proved of Temporary Second Lieutenant John Robert Gobertus Whitehead, R.F.C., who was killed in an aeroplane accident, August 3rd, at £23,772.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *War Office, September 26th.*

"*Salonica. Doiran Front.*—Hostile artillery and aircraft displayed considerable activity. Our aircraft engaged enemy machines on three occasions and drove them off."

General Headquarters (France), September 27th, 1.4 p.m.

"Three hostile aerolpanes were destroyed in air fighting on the 25th inst., and six others driven down damaged."

General Headquarters, September 27th, 11 p.m.

"Two enemy aeroplanes and two kite balloons were destroyed by us yesterday. Two of our machines are missing."

War Office, September 28th.

"*Salonica. Doiran Front.*—The enemy's aircraft has been very active, and it is reported that one machine was brought down by our fire."

"*Struma Front.*—The railway station at Angista was bombed by aeroplanes of the R.N.A.S."

General Headquarters, September 29th, 10 p.m.

"In spite of the weather, our aeroplanes have done useful work, attacking enemy reinforcements on the move. Yesterday enemy aircraft patrolled actively behind their own lines, but showed little offensive enterprise. One enemy machine was destroyed, and one of our own has not returned."

War Office, September 29th.

"*Salonica.*—Enemy aircraft displayed considerable activity."

"*Tigris Line.*—Our aeroplanes bombed the enemy's aerodrome on the morning of the 23rd inst., and again on the 27th, apparently with good effect."

General Headquarters, September 30th, 10.29 p.m.

"On the 28th two enemy aeroplanes were brought down, in addition to the one mentioned in last night's report."

War Office, September 30th.

"*Salonica.*—Aeroplanes of the R.N.A.S. bombed Angista Railway Station."

General Headquarters, October 1st, 10.15 p.m.

"Yesterday two of the enemy aerodromes were successfully bombed by our aeroplanes, and at least one machine destroyed. In the fighting over the Front four enemy machines were brought down, and one of our own is missing.

"Enemy troops and transports have been repeatedly attacked from the air with machine gun fire, and in one case several hundred infantry were dispersed."

General Headquarters, October 2nd, 11.2 p.m.

"During yesterday's operations our aeroplanes bombed several points of military importance. An enemy kite balloon was brought down in flames. There were many fights in the air, in the course of which two enemy machines were destroyed and many others driven down. We suffered no losses."

French. *Paris, September 25th. Afternoon.*

"Two enemy airmen yesterday just after 8.30 p.m. dropped 10 bombs on Lunéville Station. One woman was slightly injured. The material damage was insignificant.

"During yesterday an enemy aeroplane attacked by one of ours fell damaged north of Miserey. Three other machines seriously hit were forced to come to the ground.

"During the night of September 24th–25th 12 of our aeroplanes dropped 98 bombs on the village and station of Guiscard. The same night seven of our aeroplanes dropped 50 bombs of 120 mm. on the factories of Thionville and Rombach and on the station of Audun-le-Roman. A fire was observed at Rombach as a result of the bombardment."

Paris, September 26th. Afternoon.

"Yesterday (Monday) our chaser-planes fought 47 engagements on the Somme front. Five enemy machines were brought down, while three more, which were seriously damaged, were obliged to alight. Another machine, which was attacked at close quarters with a machine gun, fell in a disabled condition, but could not be followed to the ground.

"During these engagements Second Lieut. Heurtaux brought down his eighth machine, in the direction of Villers Carbonel, and Warrant Officer Dorme brought down his twelfth machine north of Lieramont. In the Woevre, Warrant Officer Lenoir attacked an enemy machine constructed to carry three, and after a very hard fight brought it down near Fromezey (north-west of Etain). This is the eleventh machine brought down to date by this pilot.

"Our bombarding squadrons carried out the following operations: On the night of Sunday to Monday 200 bombs of 120 mm. were dropped on the blast furnaces of Dillingen, on the factories of Sarrelouis, and on the railway station of Metz Sablons. Twenty-two bombs were dropped on the blast furnaces of Rombach and on the railway line between Metz and Thionville. During the evening of September 25th four of our machines, armed with guns, fired 82 shells on the enemy organisations of Sailly, Saillisel and of the Bois de Saint Waast. On the afternoon of the 25th 30 bombs were dropped on bivouacs in the region of Montfaucon Nantillois and 12 on the military installations near Ozannes. Finally, last night our aircraft dropped 102 bombs on the railway station of Noyon and 52 bombs on the aerodromes of Hervilly, the railway stations of Ham, Fins and Voyennes.

"Yesterday afternoon an enemy aeroplane dropped two bombs, which fell on the dunes north-east of Calais, without any result."

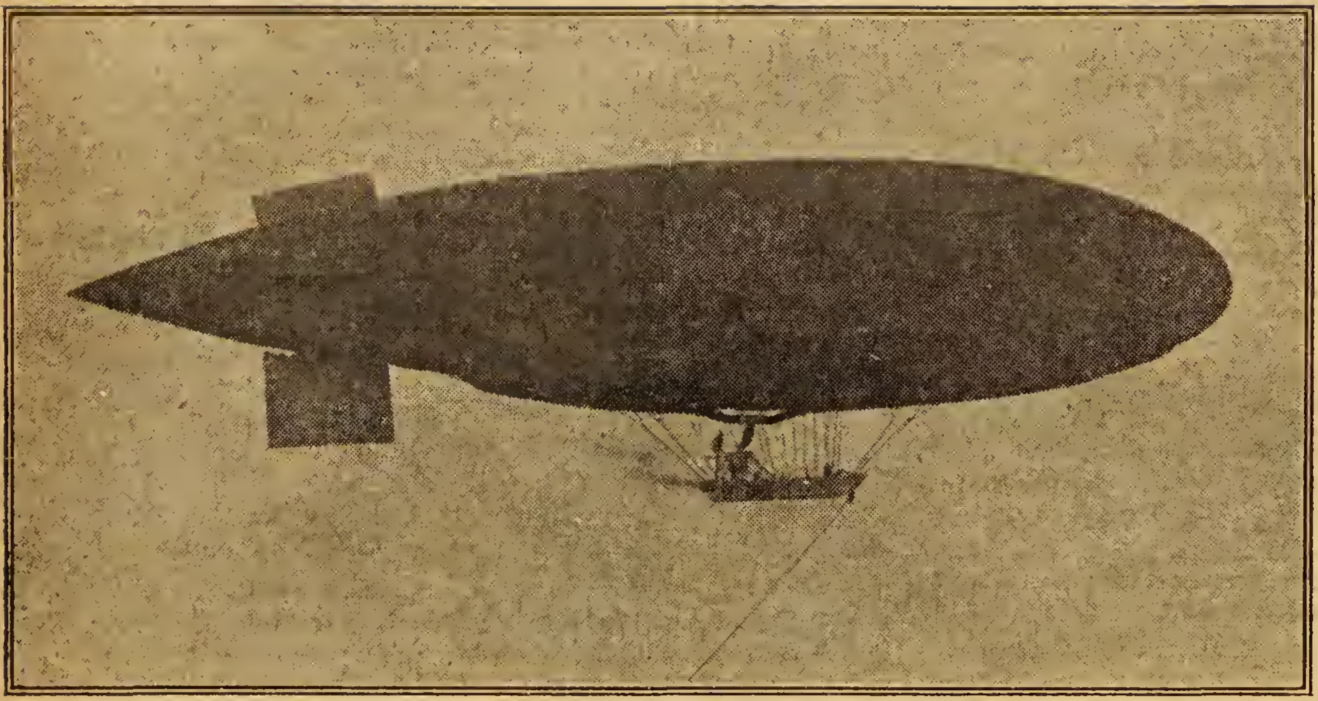
Paris, September 26th. Evening.

"It appears from fresh information that the Zeppelin which flew over the Calais district during the night of September 22nd and 23rd dropped 20 bombs, all of which fell in waste ground at a great distance from the town. It is probable that, caught by the fire of our guns, the Zeppelin got rid of its projectiles in order to ascend higher and escape."

Paris, September 27th. Afternoon.

"On the Somme front our aviators yesterday (26th) engaged in a number of fights. Sub-Lieut. Nungesser in the course of this day alone brought down two German aeroplanes between Le Transloy and Rocquigny, and an enemy captive balloon, which fell in flames in the Neuville district. These three victories bring up to 17 the number of machines brought down by this pilot up to yesterday. Two other German aeroplanes, which had been seriously hit, fell out of control, one towards Le Transloy and the other near Le Mesnil Bruntel. Another captive balloon attacked by one of our pilots collapsed near Nurlu.

"In Champagne a Fokker, attached at close quarters, fell at first in spirals, then vertically, and was smashed crashing to the ground at Grateuil (north-west of Ville-sur-Tourbe). Last night (26th–27th) a group of 14 of our aeroplanes dropped 110 big-calibre bombs on the railway station, the railway lines and the hutments at Appilly. The night before (25th–26th) the railway station at Laon got 22 bombs, and the bivouacs at Montfaucon 17."



The Japanese Parseval army airship "Yūhi" at its home ground.

Paris, September 28th.

"*Salonica.*—Our aeroplanes bombarded Konali, south-east of Monastir."

Paris, September 29th.

"In the course of yesterday a Fokker, attacked by one of our pilots, crashed to the ground north of Rheims. Another Fokker, badly hit, nose-dived into its own lines."

Paris, September 30th.

"Our bombarding aeroplanes dropped a large number of bombs on Prilep.

"Another of our machines bombarded Sofia yesterday morning, and continued its flight to Bucharest, where it landed safely."

Paris, October 1st.

"One of our aeroplanes has bombarded Sofia, and continued its journey to Bucharest, where it landed."

Paris, October 2nd.

"It is confirmed that Maréchal de Logis Vialet brought down his fifth German aeroplane in the region of the Somme.

"Warrant Officer Bloch brought down a German captive balloon east of Bapaume. This is the fifth balloon brought down up to now by this pilot."

Italian. *Rome, September 27th.*

"Last night one of our airships, in spite of adverse weather, succeeded in reaching the Carso, dropping bombs on a column of enemy troops and convoys on the road from Comignano to Castagnevizza. Although discovered by the enemy's searchlights, and fired on by artillery, the airship returned safely."

Russian. *Petrograd, September 26th.*

"An enemy aeroplane of the Ilya Mouromets type appeared over Hitzenberg Station and threw 17 two-pood (72-lb.) bombs, without causing any damage.

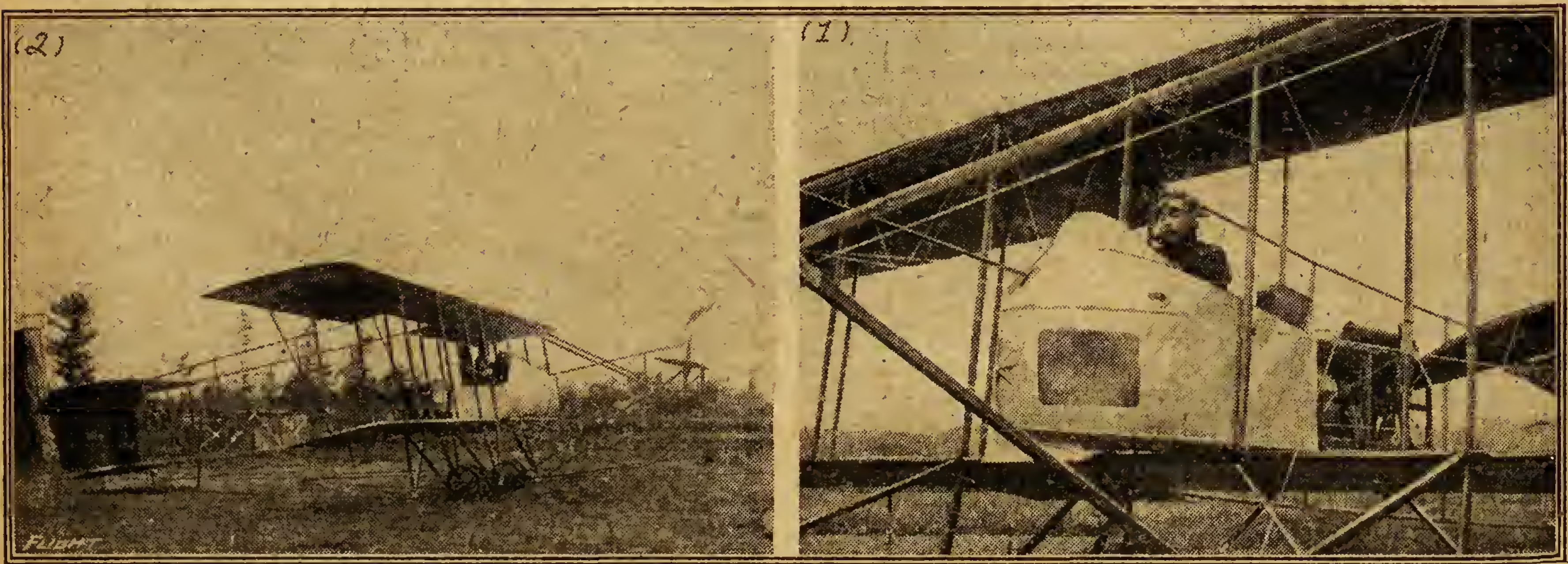
"In the region south of Dvinsk one of the enemy aeroplanes, being fired upon by our artillery, turned over and was compelled to land. It was observed that the machine became enveloped in black smoke as it descended towards the enemy's lines."

Petrograd, September 28th.

"On September 26th our seaplanes, under the command of Lieut. Gorkovenko, made a successful raid on the enemy aerodrome on Lake Angern, and dropped bombs on their objective. Our machines were subjected to the fire of the enemy batteries, and were engaged in combat with 20 enemy machines. During this unequal contest Lieut. Arseni Gorkovenko unfortunately perished, and his aeroplane was lost."

Petrograd, September 29th.

"*The Centre.*—Our airmen carried out a raid on the rear of the enemy's cantonments in the Borguny-Krevo district. The bombs dropped caused explosions and fires in the enemy's depôts at various points. Bombs were also dropped on convoys, a narrow-gauge railway, and on wagons. In the course of the raid there was an air fight, in which four German machines were brought down. One of our air aircraft, after a fight with two Albatros machines, fell in the enemy's lines. In addition to this, we lost a machine of the Morane-Parasol type."



AVIATION IN JAPAN.—On the left, three-quarter front view of the 70 h.p. army biplane No. 6 at Nagoya parade ground On the right, Japanese military aviator Lieut. Takeda, in the pilot's seat of the latest army biplane (M. Farman type) which he has been flying at Tokorozawa aerodrome.

Petrograd, October 1st.

"In the region south of Brzezany an aerial encounter with a German Albatros took place. The gallant Staff Cavalry Captain Tchirkoff attacked an enemy aeroplane and forced him to descend abruptly in the German lines."

Roumanian. *Bucharest, September 24th.*

"Last night a Zeppelin succeeded in reaching Bucharest, but was driven off by our guns. During its journey the airship dropped three incendiary bombs, which caused no damage."

Bucharest, September 26th.

"An air squadron yesterday afternoon dropped bombs on Bucharest. No military damage was done, but the bombs fell on a sanatorium and an orphanage, killing 60 of the inmates and injuring many others. More than two-thirds of the victims were women and children.

"During the night of the 25th a Zeppelin dropped bombs on Bucharest, killing five children. Our aircraft dropped bombs on camps in Transylvania."

Bucharest, September 27th.

"Hostile aeroplanes yesterday dropped bombs on Bucharest and the neighbouring villages, causing some loss of life, especially among women and children.

"During last night a Zeppelin dropped incendiary bombs on Bucharest, causing two small fires, which were quickly extinguished. One woman was killed and another injured.

"The Zeppelin was driven off by our artillery.

"In the region of Toplitza our guns brought down an enemy aeroplane."

Bucharest, September 29th.

"Hostile aeroplanes dropped bombs on Cerna Voda, Alexandria and villages south of Bucharest. An enemy aeroplane was brought down near Padosu, in the Mehediutzi Department. An enemy aeroplane arrived at Bailesti from the direction of Salonica."

Bucharest, October 1st.

"In attacks by enemy aeroplanes bombs were dropped on Bucharest, where two women and five children were killed; on Cerna Voda, and on Budesti."

German. *Berlin, September 25th.*

"In yesterday's numerous aerial engagements we shot down nine aeroplanes. Our anti-aircraft guns have brought down four airmen during the last few days.

"Six citizens were killed and 28 seriously wounded by an enemy bomb attack on Lens."

Berlin, September 26th.

"A Russian giant aeroplane near Borguny, west of Krevo, after a hard fight with one of our airmen, was shot down. In the same region a Russian monoplane also succumbed in the course of an air fight.

"This morning the naval air station on Lake Angern (west of the Gulf of Riga) was again unsuccessfully attacked by two Russian seaplanes. Our aeroplanes succeeded in engaging one of the seaplanes above the Lake, and shot it down after a short fight. The second seaplane was damaged by our artillery fire, and escaped in the direction of Runö Island.

"An airship and aviators again attacked Bucharest."

Berlin, September 27th.

"Yesterday and the day before six enemy aeroplanes were brought down in aerial fights on the Somme. Another machine was brought down yesterday in Champagne.

"The airship and aeroplane attacks on Bucharest were repeated."

Berlin, September 30th.

"Our aeroplane squadrons successfully attacked the railway bridge of Cerna Voda and enemy camps."

From Other Sources.

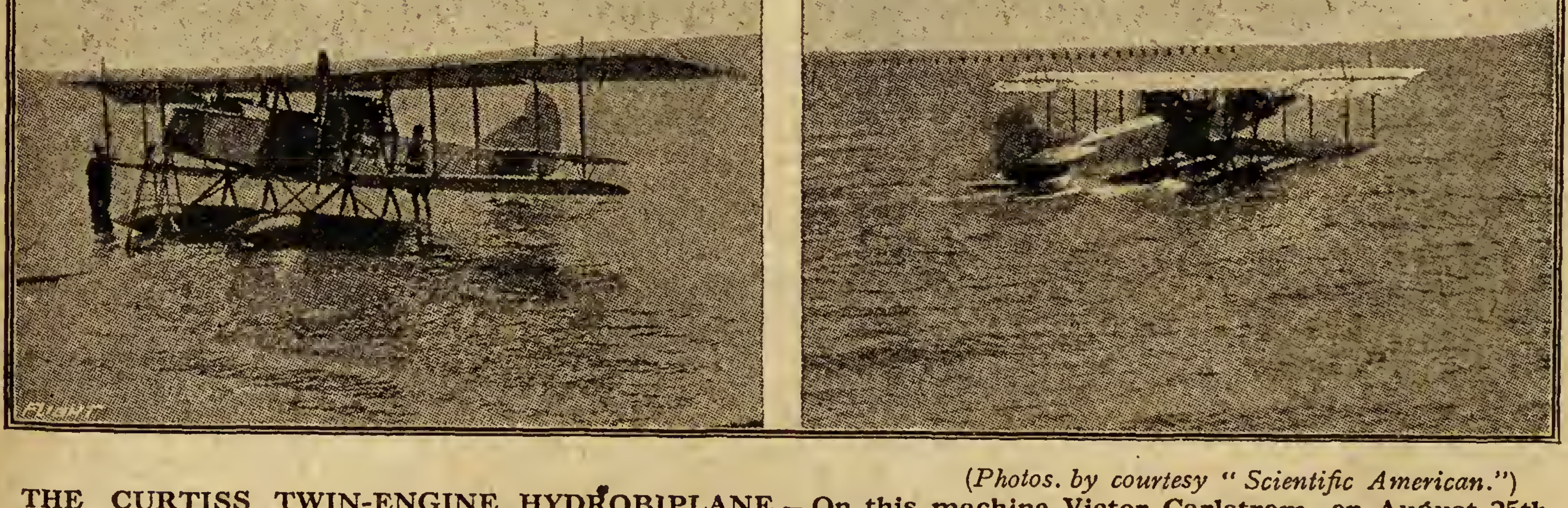
Mr. W. Beach Thomas, in one of his despatches to the *Daily Mail*, also writes on the subject as follows :—

"But only in one respect, I should say, does his reluctant admiration of his enemy entail any contempt for himself. He admires his own artillery at the same time that he admires ours; but nothing of this common respect colours his view of his own air service. The Iron Cross of the airmen has entered into the soul of the infantrymen. 'The airmen,' he says, 'sit covered with medals in the best restaurants and grow fat; but as for flying they never think of going near Mr. Englishman.'

"Comparison of the two air services is a common subject of trench talk in German ranks. 'The Englishmen come so low you have to take care the propeller doesn't hit your head,' wrote one German. 'You can't move by day or they see you, and perhaps shoot at you.' 'Some day they'll come and take us out of the trenches by the scruff of the neck.' Such sentiments could be quoted for pages. The soldiers are probably unfair to their own men; but it is true that the loss of the offensive in the air has supremely depressed the German Army and increased its admiration for the British and French opponent."

Mr. Philip Gibbs, in a despatch to the *Daily Telegraph* on September 12th, writes :—

"We are still below the line of the Ginchy telegraph on the high plateau, so that we have not yet obtained full observation of the valley slopes on the other side, though by the capture of Ginchy itself we have robbed the enemy of his old point of view, which was of enormous value to him in registering upon our batteries and watching our movements. His only means of observation now is from the air, and yesterday there was visible proof of this, because fifteen or sixteen of his kite balloons came creeping out of the clouds above the plateau here, peering at us at close range. I should hate to be a German observer in one of those 'sausages,' as our men call them. They have a painful reminiscence of six such gas-bags brought down on one day, which was June 30th last, before the great battle began. Since then they have not floated



(*Photos. by courtesy "Scientific American."*)

THE CURTISS TWIN-ENGINE HYDROBIPLANE.—On this machine Victor Carlstrom, on August 25th last, put up a new American distance record, flying a circular route between Newport News and Cape Charles of 661 miles in 8 hrs. 41 mins. The weather was bad, and he carried as passenger a mechanic, whose services, however, were not called upon throughout the trip.

aloft with any safety. On September 1st two of them were attacked by one of our air-pilots, who fired machine guns at them and dropped bombs on to them so that they had to haul down hurriedly in a great scare, and a few days ago one of our knights-errant of the air crossed the enemy's lines at nearly 12,000 ft., mounted directly above a German balloon, and dived upon it, until he was no higher than 500 yards above it. Then he fired until he almost touched the great bag, and as he passed, it burst into a vast flame and was burnt to a wisp of smoke in a few seconds.

"For fighting purposes these German 'Peeping Toms' are not safe and certain means of observation, with our airmen hovering near them, even though they have adopted a new means of defence, which is a gun below them sending up a high-reaching flame to scorch the wings of any British moth who dares to come too close. Our moths will take the risk, I guess. To-day a German plane did come across our lines, where I was wandering about some old dug-outs and trenches, watching out batteries plug away in a leisurely style, and wondering at the relative quietude of an 'off day' of battle. But that hostile bird was scared back by some of our hawks, and they followed him well into his own country of the sky, with their usual audacity.

"There is no humbug about all this. On this part of the battle-front we maintain the mastery of the air and blind the enemy's point of view. It makes all the difference to our artillery, and it is extraordinary to go through the recent history of the Royal Flying Corps and to note how many German batteries have been put under heavy gun-fire by aerial registration. It is not easy to knock out a battery by a direct hit. A gun is a small target, and shells may crump it all round and leave it unscathed; but on the laws of luck we have certainly scored many direct hits during the last week or two. Many ammunition dumps and pits have been blown up after aerial reports, as I have seen myself several times, watching the high, enduring volumes of black curly smoke."

Tribute from the Enemy.

Testimony that the British and French pilots hold the mastery in the air at the Front is forthcoming in a number of letters and diaries which have been found on prisoners. Thus the *Morning Post* correspondent quotes the following from the diary of a German officer:—

"August 1st. . . . Our aviators are—none of them show themselves above our lines.

"August 2nd.—The French aviators fly about 600 ft. above our lines, while none of ours put in an appearance. We cannot fire on them without immediately attracting heavy artillery. We have, therefore, to remain in our trenches, where it is as hot as ever, dying of thirst, and waiting to be killed or buried by shells.

"August 3rd.—The French use nothing but heavy guns, and have been bombarding us all day, their fire control being beyond reproach as the result of the action of their aviators; but ours still keep out of sight. The French aviators are masters of the air.

"August 6th.—The value of our aviators is so small that even far behind the lines they are not masters of the field. Generally our aviators are far from being as good as the French or English, and consequently we do not dare to move a step outside our leaf-covered shelters. Enemy aviators keep circling round the wood we are in and signalling our presence. Whether we like to recognise it or not, it is evident from this point of view we are inferior. We are told that Germany is holding her own in the air, but it is no use telling us that, and that is why we have these enormous losses. There is absolutely no one to drive away these parasites that give us no respite from dawn till night. The moral effect on us all is as bad as it can be. Final success, however, depends on the co-ordination of all available arms, and that is what is wanting here. The situation is the more astonishing because of the large number of French aeroplanes that we bring down.

"August 12th.—Enemy aviators flying at 100 metres took part in the fighting with machine guns. Some of our men were wounded in the head by bullets from above."

In a diary, according to Reuter, found on a soldier of the 125th Regiment, captured in Delville Wood, the following occurs:—

"During the day one hardly dares to be seen in the trench, owing to the English aeroplanes. They fly so low it is a wonder that they do not pull one out of the trench. Nothing is to be seen of our German hero-airmen, and yet the brilliant ratio is supposed to be 21 to 89. The fact that the English are a thousand times more daring was, however, not mentioned. One can hardly calculate how much additional loss of life and strain on the nerves this costs us. I often feel doubtful regarding the issue of our good cause when such bad fighters are there to champion it. No one out here needs to be foolhardy, but everyone has the duty and responsibility of so filling his place that he can always answer to his conscience."

The same correspondent quotes an extract from a German regimental order:—

"Every man is to find himself a hole, and is not so much as to show his nose except when the sentries are detailed. The shooting was quite exceptional this morning, due to the fact that the officers and men of the 8th Company, 2nd Battalion, 104th Regiment, were swarming about and making themselves at home. This will not do, as we are at war. Every movement is seen from enemy aeroplanes or from the neighbouring village of Longueval. For this reason the trench must appear dead. The standing about of sentries, orderlies and relieving sentries is forbidden, and strict silence is to be maintained."

* * *

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly, Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park & District (66, South View Rd., Hornsey).

Monthly Report.—The past two months have been very eventful for this club, both as regards the quality of the flying and the number of models employed. Four new members have also been enrolled, three of whom are attached to the Junior Section which has recently been formed. A club meeting was held at Mr. Hardinge's (Vice-Secretary) house on September 14th when several changes were made in the management of the club, and a new procedure for determining the results of competitions was discussed. A Junior Section, mentioned previously, was formed at a reduced annual subscription, while a Model Engineering Section, which has been working privately for a year, was officially recognised and attached to the club. Most of the flying took place in September. On August 5th Mr. E. Coleman was flying his hollow-spar model, a Morane tractor was flown by Mr. F. E. Rayner, and at the end of the afternoon they both made some fine r.o.g. flights. Mr. A. Richards tested a hollow spar, but owing to a "floppy" plane no prolonged flights were made. On the 19th only two machines were flying. They were both Morane type, "piloted" by Messrs. W. Hardinge and F. E. Rayner. September 2nd was also a quiet day, Mr. Hardinge being the only member out. The 9th was fairly busy. Messrs. E. Coleman and A. Richards were at work with their hollow-spar models, making many flights of ¾ mile. Mr. Rayner's Morane especially distinguished itself at dusk when it was rising off the ground without a push, and flying about 400 yards. The plane of Mr. Hardinge's model broke at the beginning of the afternoon, which rendered him *hors de combât*. Two more hollow-spar models were flown by Mr. C. J. Burchell, a new member, very successfully. The chassis of these machines are quite novel, and altogether the machines are of pleasing design. The 16th was the most successful day. No fewer than twelve models were at work, nine of which were attached to the club. Hollow spars were much in evidence, and were making some very spectacular flights, owned by Messrs. Richards, Coleman and Burchell. Mr. H. R. Weston, of the Aero Models Association, visited the club with two models, which behaved splendidly, doing some good durations. Three new members were enlisted during the afternoon, and were drafted to the Junior Section. On the 23rd the weather was excellent for flying. The chief event of the afternoon was a record-breaking flight by Mr. Burchell's machine. This was a 4-ft. span, single-screw "pusher" monoplane, fitted with a 4-ft. hollow spar, a 12-in. propeller driven by three strands of one-eighth inch square rubber. It made a circular flight lasting 92 secs., and taking into consideration that this was about the sixth flight it had made, it was a very good performance. The construction of the plane is worthy of mention. Instead of the ribs being nailed to the main spars as is usually the case, each one is attached by means of a small aluminium clip, which not only renders the plane light and strong, but gives the machine as a whole a very workmanlike finish. The usual hollow-spar "'buses" were flown by A. Richards and E. Coleman, and Mr. Rayner's veteran Morane monoplane was also out. Another similar machine was also flown by W. Hardinge. The new junior members, R. E. Stansell, C. Burchell and C. E. Plummer were all flying neat little machines very successfully. During the afternoon several members tested the effects of intermittent explosions during the models' flight. The ordinary multiple cracker was employed, with explosions occurring every two or three seconds, but although as many as a dozen reports took place, they seemed to have little effect on the model, the latter sometimes rocking slightly laterally. The 30th was windy, and the exhibitions were not so good as usual. The usual hollow spars were out, with the addition of one each by Mr. F. E. Rayner and C. E. Plummer. During the last two months twelve new machines have made their *débuts*, and on each Saturday the club has met at Parliament Hill, where large crowds of spectators have witnessed the proceedings.

Scottish Ae.S. Model Ae.C. (5, Doune-quadrant, Glasgow).

Monthly Report.—The annual general meeting of the club was held on September 7th in the Engineers and Shipbuilders Institute. The report was read and the financial statement, which showed a good balance on the right side, passed and approved. It was agreed to suspend all subscriptions until after the war, and that all paid for the past year be refunded. Until peace is declared it was decided to reduce the quorum from five to three members. All office bearers to stand as at present, Messrs. Arthur and Pinney to be co-opted as members of committee. Eleven members of the club have gone "On Service," nine of whom are well and fit as far as the secretary knows. The sad news of the death of one of our younger members, Mr. Geo. E. C. Hunter, on August 24th, at High Wood, from shrapnel, has just come to hand. Mr. Hunter took a great interest in model making even though he only joined us six months before war was declared. He is the first member to make the extreme sacrifice. It is with great pleasure we welcome the safe return of one of our older members, Mr. C. F. Arthur, who has been discharged.

THE BARIMAR REPAIR SERVICE.

"No repair too large, no repair too small," is the motto of Messrs. Barimar, Ltd., in connection with the repair service which they offer in connection with their new works in Lamb's Conduit Street, and a walk through the shops shows that the claim is in every way a justifiable one. The works are, in fact, a hospital for motors (including aero engines), and judging from the variety of repairs which are now going through there is no conceivable accident or mishap which can happen to any part of a motor vehicle that cannot be made as good as new. Perhaps the most important department of the works is that devoted to welding. It is practically impossible to give a comprehensible summary of the range of repairs which are being successfully tackled, but a brief reference may be made to some of the hundreds of jobs. Here, for instance, is a crank chamber with large pieces torn out of the side and bottom, the result of a broken connecting-rod; when it leaves the works it will be impossible to tell that it was ever damaged. Next is a crankshaft looking as good as new, although when it arrived at the factory it was in two pieces. Not far away is a heap of induction pipes from American aero engines; the ports are being enlarged, and one or two other alterations made so as to ensure a freer flow of the mixture. All sorts and sizes of cylinders—singles, in pairs, *en bloc*, air- and water-cooled—are undergoing treatment from simple cracks to the replacement of parts which have been broken away. At the present time the works are largely taken up with war work, repairing damage to parts of vehicles or motors which have come to grief in the country's service. No matter of what metal the fractured part is—aluminium, steel, bronze, copper, malleable and cast iron—Messrs. Barimar are able to satisfactorily restore it to its original use and strength. So sure is the firm of the success of their method, that they guarantee to return the amount paid if the repair does not prove satisfactory.

Adjoining the welding shop is a machine shop fully equipped with modern electrically-driven tools and appliances, so that all repair work can be cleaned up and finished without recource to outside help.

On the next floor is the sheet metal shop which is reserved for radiator and lamp repairs. Aeroplane and motor radiators—some badly smashed, others leaking or furred up—as well as several to be converted from one type to another, are lined up by the hundred for treatment, while in another department new radiators for aeroplanes and motor vehicles can be seen in the process of manufacture. Lamps have a special department to themselves, and some of the reconstructions which are carried out can only be described as wonderful, for a lamp which has to all appearance been run over can be restored so perfectly that it would be impossible to tell that it had not just been taken from the showroom. The polishing shop is equipped to polish and finish radiators and lamps, as well as to plate and burnish brass or copper fittings, and it is here that the Barimar cast aluminium number plates are polished and finished after leaving the foundry.

The success which has attended them where so many other firms have failed is largely due to the fact that Mr. C. W. Brett, the Managing-Director and General Manager of Messrs. Barimar, has from the first recognised that it is specialist work and cannot be treated as a side line. The new works are admirably adapted for their purpose, all the shops receiving an abundance of natural light and ventilation. They have been planned and organised to deal in a thorough manner with every variety of repair work, and the firm have trained a band of workers who are experts in the various departments and who take a personal interest in their work. Each shop is under the charge of a foreman craftsman; while in their Works Director, Mr. H. E. Lamplough, Messrs. Barimar have not only a fully qualified engineer and organiser, but one who has every detail of motor work at his finger's ends, a very necessary gift in dealing with the thousand-and-one jobs which are sent to Messrs. Barimar to tackle, especially when it is borne in mind that in almost every case the repair is wanted "at once."

A VIEW OF THE HEADQUARTERS OF THE BARIMAR CO. IN POLAND STREET, W.—On the right, the new Barimar works in Lamb's Conduit Street. These works are a regular "hospital" for the motor industry, and almost every make of engine can be seen undergoing repair of one sort or another, while a large shop is devoted to making damaged radiators and lamps as good as new.

* * *

Further Prizes for Zepp. Strafers.

Mr. John G. Murray, of Thirsk, has offered £500 to airmen who bring down Zeppelins on English soil, with a limitation to the number of four.

Another Giant Zeppelin Story.

From Petrograd, *via* Copenhagen, comes the latest story of a giant Zeppelin. Four are due to be ready this month, and it is therefore somewhat disconcerting to read that the airships will have six or seven motors, developing 15,000 h.p. It seems to be leaving it rather late to decide as to how many motors will be used. The other particulars, which are given, are: length, 780 ft.; capacity, 2,000,000 cubic ft.; load of bombs, 11,000 lbs.; range of action, 3,000 miles; altitude attainable after bombs have been dropped, 17,000 ft. They are to carry a crew of 35.

SIDE-WINDS.

During last week the little Beatty tractor biplane fitted with a 30 h.p. Anzani engine was taken out for trial, but in a preliminary canter the fact emerged that the centre of gravity appeared to have a very strong affinity for districts lying considerably behind the centre of lift; and so, with his usual quickness in coming to a decision, Mr. Beatty proposes to take the little Anzani out and put his own 60 h.p. engine in instead.

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Which calls to mind that the reduction gear for the Beatty engine is now to hand, and will be fitted to one of the monobloc engines, probably the same that is to be fitted to the tractor biplane, a combination to be watched with interest.

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Cross-country races have grown rather scarce these days, and it was therefore with a goodly amount of appreciation that visitors to Hendon on Saturday watched two de Havilland scouts start off side by side, and, after circling around one another for a few moments, chase one another until disappearing from view beyond the Welsh Harp.

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Beyond covering, little apparently remains to be done to the new L. and P. single-seater biplane, of which the *fuselage*, wings and tail planes are now finished. It will be fitted with a 50 h.p. Gnome, which is mounted between double bearers, the body being wide enough in front to accommodate the engine—that is to say, some 3 ft. wide. After being used to machines where the pilot's cockpit is so small that he practically has to be pushed into it by the aid of a shoe-horn, this body looks immense in width, and certainly affords the pilot plenty of elbow room.

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The new flying school at Cheltenham is now, we understand, in full swing, a start being made on Sunday last. No end of trouble has been taken to ensure that the ground is in as good a condition as it is possible to get it. In some places the turf has been raised considerably to equalise inequalities. The result is a beautifully level stretch for rolling and landing, on which even the novice finds no difficulty in alighting safely, so that he is pleased; while on the other hand the smooth surface may be expected to very materially reduce the amount of smashes, thus saving the proprietors of the machines a goodly percentage of repair bills, giving a good return for the initial outlay on levelling the ground.

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The Cambridge Flying School has arrived at a stage of its development where all the capital required is in hand, and the registration has been duly attended to, so it would appear as if a start should soon be made here also.

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Generally speaking, things were very quiet at Hendon last week-end, a number of the firms being shut down for the holidays. At the Grahame-White end of the aerodrome all the hands were away with the exception of a small gang hard at it moving the last of the machinery across to the new works on the other side of the old footpath, so as to have everything ready for a start in the new premises on the Monday.

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From the 1st of January next the handling of "Shell" spirit will be taken over by the Shell Marketing Co., Ltd. In the notice of the change it is pointed out that by this new arrangement the Shell Marketing Co., Ltd., will enjoy all the advantages of the vast resources of the parent companies, with their own fields of production and refineries practically encircling the earth, their extensive fleet of tank steamers, their great financial strength and almost unlimited resources. The significance of this great strength of the source of supply will be readily appreciated by commercial users of motor spirit, who realise that—particularly under war conditions, when they are compelled to rely upon themselves rather than upon the railways—they need the utmost protection for the motor traction which they have brought into use for the delivery of their goods, and they are now making their arrangements with the Shell Marketing Co. to ensure their 1917 supplies of motor spirit.

All that the parent companies' unparalleled experience has taught them in the direction of service efficiency has been brought into the organisation of the new concern. The company's 500 motor spirit depôts now form a network amply covering the entire kingdom. The motor delivery fleet has been considerably augmented. Excellently-appointed divisional offices have been established in all the great centres. All of which is real good hearing for users of Shell motor spirit.

A very satisfactory item in connection with the new company is that Mr. J. Cates, who is so well known in Shell matters, will be associated with the important work of the new company.

FROM PANELS TO PROPS.

It has often been remarked what a number and variety of firms have been drawn into the aviation industry during the war, not only firms who were doing work requiring comparatively few alterations to already existing plants for the successful production of component parts of aeroplanes or complete machines, but also firms whose previous business had, one would think, nothing in common with aircraft construction. In the former class must be reckoned Messrs. Aldam, Heaton and Co., Ltd., the well-known ships' decorators and furnishers, who have works in Agincourt Road and in Parkhill Road, Hampstead, and whose head offices are at 156, New Bond Street. Before the war this firm were engaged on making panels, wood carvings and furniture for passenger liners, having equipped among others the "Olympic," the "Britannic" and other White Star liners. This class of work necessarily required the most thorough knowledge of woodworking, including careful seasoning to avoid warping, &c., and it is therefore not surprising that the firm, once having taken up various kinds of woodwork in connection with aeroplanes, have proved more than equal to the task. They are at present engaged chiefly on the construction of four-bladed air screws, of which they are turning out large quantities, and the workmanship and general finish of these are beyond reproach. The number of rejections have, we understand, been surprisingly small, as the utmost care is taken during the whole process of construction to ensure perfection.

Adjoining the old premises are some that have hitherto been employed by another firm. Owing to the pressure of their work these have now been acquired, affording very considerable extensions, and when in readiness they will enable the firm to turn out a considerably larger quantity not only of propellers, but also of other aeroplane parts. A large stock of different timbers is already at hand awaiting the time when the new premises shall be ready, and judging by the results obtained in the manufacture of propellers there is every reason to suppose that the construction of other aeroplane parts will meet with equal success.

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EDITORIAL COMMENT.

More Dilution of Labour Required.

THE pressing need of the moment is men, and yet more men. Men for the Army and Navy to fill the gaps caused by the terrific wastage of war and to maintain the fighting services at the standard required to prosecute the war to its successful conclusion. Men for munition factories, in order that our fighting troops may be able to depend upon an ever-increasing supply of the material aid to victory—shells and more shells. So far as concerns the supply of men for the Army, there are two ways in which the necessary numbers can be obtained. The one is by the raising of the age limit to 45, a step which is being very seriously contemplated by the Government, if, indeed, it has not already been decided upon. The second and much preferable method is by the process of "combing out," of which so much has been heard of late.

We have called this matter the more preferable, and advisably so. Regrettable as it may be from the point of view of a great many men of 45, there is no doubt that in a war such as this the man of that age is not value for money. In individual cases he is, and more than value, but the individual case does not govern the principle that this is a young man's war and that the game as played now is essentially one for the young. That being so, it is obviously bad economy to take the men of 45 until the supply of the younger material has been exhausted. The principles being as stated, the question then arises: How is the supply of younger men to be obtained? To judge by the very large number of men of military age one sees in the streets and in public places generally, the men are here. The question is how they are to be made available. Many, of course, will automatically come into line when the tribunals deal with the final appeals. According to the latest available figures, nearly 400,000 temporary exemptions have been granted to eligible men, and in addition there are some 200,000 appeals pending. These figures give one to think that the meshes of the net are pretty large!

For one reason and another a very large proportion of the 600,000 will entirely escape military service. Probably no more than 150,000 will reach the fighting line. Manifestly, that figure is totally insufficient to the needs of the situation, and we must look elsewhere for our man-power. The Man-Power Distribution Board has reached a number of important decisions, which have been issued through the Press Bureau. In the *communiqué* the Board observes that the process of labour dilution has been very unequally carried out in different districts and in different works. That this is so is notorious. We believe we are quite within the bounds of strict accuracy in saying that in certain districts the amount of "dilution" does not exceed one per cent. of the labour employed. The Board is very strong on the necessity for proper dilution of labour, and goes so far as to say: "IT IS THE ONLY METHOD BY WHICH AN EXTENSION OF THE AGE FOR COMPULSORY SERVICE CAN BE AVOIDED."

Now, if the only way to secure the men without raising the age limit is by the dilution of labour, then the course is a perfectly obvious one—labour must be diluted in spite of the wail of the conscientious objector. We are fully conversant with all the arguments of the trade unions, who see in "dilution" a deadly menace to their interests after the war. It might have been thought that the answer to that line of argument, that if we all stop to consider our immediate interests, there will be no "after the war" to concern us, would have been sufficient. Apparently, however, it is an answer that does not go all the way. But whatever the arguments for or against, the course is quite clear and must be taken.

We are fully alive to the supposed danger of the unskilled worker ousting the skilled later on. Even if there were as much as there is little in it, it would have to be disregarded, since there is only one thing that matters now, and that is to get on with the winning of the war by all and every means to hand. But when we come to examine what "dilution" really means in the way of danger as indicated, we find that there is surprisingly little in it. Take, for example, the case of a woman in a machine shop, engaged on munition work. She is doing the work of a skilled mechanic, or, to be correct, the work that under normal circumstances would be done by a skilled workman, which is not precisely the same thing. The mechanic, through years of training and experience, has become capable of carrying out *all* the processes that go to the machining and finishing of, say, an 18-pr. shell. The woman, on the other hand, has been taught to be proficient in *one* process only. She has become exceedingly deft at that, no doubt, but the fact remains that she is no more than a one-process worker, and cannot by any stretch of imagination be called "skilled" in the ordinary meaning of the term, and to a degree that would enable her to fill the place of a really skilled mechanic.

However, it is somewhat profitless at this period to waste time in the discussion of nice points. We are up against a clearly-defined position, and it is for the whole nation to co-operate in the work that lies before us. The part of the loyal employer is to examine things so far as they affect his own particular business, with an eye to the discovery of how best he can serve his country's need. To come close home, there are some men at present employed even in our aircraft factories who, by process of judicious dilution, could be spared for service with the colours. As we have repeatedly in the past stated, we know that women have been imported into the industry in very large numbers, which is to say that it has been fairly well diluted already. But it is possible to carry the process much farther, and we appeal to the industry to take careful stock of the situation as it affects the individual firm, and to loyally respond to the appeal of the Board. It may well be that before the end comes we shall want the men of 45 and even older, but in the meantime, it is the younger men who are wanted, and whom we have to get, either by hook or by crook.

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Honours for "Zeppelin Slayers."

A movement has been set on foot to confer the freedom of the City of London on the three airmen concerned in the bringing to earth recently of hostile airships engaged is raiding London. Let us hasten to say that we are in full accord with the conferring of this honour on the three gallant young officers concerned. It is an entirely fitting reward that they should be made freemen of the City they have assisted so effectively to defend. We are able, too, to regard with satisfaction the announcement that several of the most important of the Provincial cities propose to follow suit, and to confer their freedom on airmen concerned in the destruction of hostile airships within their respective areas.

When we come, however, to the discussion in the public Press of the adequacy of official rewards, we are on more debatable ground. Certain of our daily contemporaries have seen fit to criticise the award of the D.S.O. to two officers of the R.F.C. for services in the direction noted, contrasting the award with the V.C. of Lieut. Robinson. One paper goes so far as to lay it down that the flying man who brings down a Zeppelin is in any ease entitled to the supreme award of the V.C. We are not prepared to argue the respective cases. But we do deprecate the public discussion of such matters on the very defective premises available. The way in which we regard it is that the military authorities who were responsible for advising His Majesty of the proper awards in each case were cognisant of *all* the facts, and made their recommendations accordingly. We must be content to leave these matters to the proper and competent people. To discuss the adequacy or otherwise of awards made for gallant or distinguished service in the field is to cheapen such honours all round. We do not want our highest military decorations to fall to the level of the Iron Cross, which is what they inevitably must do if their award is to be dictated by the newspaper Press.

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A Goodly Proportion.

A notable feature of the investiture held by His Majesty the King last week was the very large number of flying officers who received decorations. Of about 200 officers thus honoured, twenty belonged either to the R.N.A.S. or R.F.C. Ten per cent. is a goodly proportion indeed, and speaks far more loudly that mere words, of the brilliant services to the nation of the newest fighting arm. It is the more remarkable in that the flying service as a part of the scheme of military defence did not exist at all in its present form until but little more than five years ago. In February, 1911, the "Air Battalion" was constituted, with an equipment of five aeroplanes and three airships, one of which was ineffective. Now that arm has expanded into a force which has entirely altered the methods of war, and its *personnel* actually reaps such a large proportion of the awards for distinguished service in the field. Comment is entirely superfluous.

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The Engaging Hun.

The best indication we have had so far that the Germans realise that the game is practically up for them is in the squealing of their Press. An example of the altered tone which has come over their newspaper articles is an editorial which recently appeared in one of the leading South German organs, the *Schwabischer Merkur*. The article in question is

AT HENDON AERODROME.—Mr. W. T. Warren, jun., on the L. and P. biplane returning to the 'drome after a looping-the-loop bout.

called, "Enemies all Round," and is apropos the entry of Roumania into the war. Here is an extract from this article which is eloquent of the state of the German mind :—

> "We cudgel our brains, and cannot understand how it is possible that such devilish hatred has centred against us Germans, even in places where we, in our good-naturedness, would have looked for friendship. We long for the time when we are again allowed to speak our minds in the Press—not about the division of the war booty, for that is premature—but about the means to gain the victory, the uses of our U boats and Zeppelins, and whether, as some maintain, it is still possible to come to an understanding with England."

Why they should be reduced to the cudgelling of brains over so simple a proposition as this, passes comprehension. Passing over such matters as air raids on undefended towns and villages ; the sinking of defenceless passenger ships, with the incidental murder of inoffensive civilians, all of which it might conceivably be argued are likely to produce a military effect, the German can be answered out of his own mouth. As we have said, though the acts we have quoted have justly met with the abhorrent disapprobation of the whole civilised world, it is open to the Germans to raise the defence that the killing of non-combatants is regrettable, but is nevertheless an inevitable accompaniment of war. That, we know, is in effect the defence they *have* raised. But what is to be said of their latest addition to the amenities of war ? In consequence of the successful air raids carried out by the Allies on Zeppelin and aeroplane sheds near Brussels, the engaging Hun now places prominent citizens of Brussels within those sheds in the hope that by so doing they will prevent the Allies from attacking them. That is one of the reasons—or it should rather be said that it is the state of mind and feeling that prompts such action, that makes the very name of German stink in the nostrils of the world. No need for the gentle Hun to cudgel his brains about the matter. The smallest amount of introspection should supply him with ample reasons for the unutterable dislike with which he is regarded.

* * *

A British Trade Bank.

Lord Faringdon's Committee, which was appointed by the Government to investigate the problems of trade finance after the war, has issued its report with praiseworthy promptitude. That Report is of surpassing interest to the British business man, since it recognises what has been felt by the business community for years, that the existing banking facilities are by no means adequate to the needs of modern commerce.

We have grown used to the spectacle of the man with a thoroughly sound business proposition, without money enough of his own to finance it through, begging here and there for the necessary capital, often without success, and as often able only to secure it on the least advantageous terms. It is wide of the mark to say—as we have heard it said—that no sound business scheme need fail for want of money. Theoretically this may be so, but in practice we have all known the contrary. The history of the aviation industry will supply more than one instance, to go no farther, for our illustration. Under the present banking scheme, the joint stock banks will only advance money against securities that can be locked up in the safe, as it were. The best of commercial undertakings are apt to be turned empty away when they have nothing but "futures" to talk about.

In that respect our financial system has lagged far behind that of Germany, where industrial banks exist for the express purpose of financing sound businesses. It is this gap that the Report of Lord Faringdon's Committee—composed mainly of bankers—proposes to bridge over by the creation of a Trade Bank, under Royal Charter and with a capital of £10,000,000, the first issue to be from 2½ to 3 millions sterling.

With the full terms of the Report we are scarcely concerned here. What is of interest is the recognition of the principle that legitimate industry requires up-to-date methods of finance if we are to regain and retain our commercial supremacy after the war. Undoubtedly, such a Trade Bank as that suggested in the Report would go far towards removing one of the most serious handicaps of commerce. The Report might go farther than it does in the direction of arranging for the financing of internal trade. So far as it is possible to discern, the Committee's recommendations are confined to the financing of businesses doing an "overseas" trade. To our way of thinking, if we are to hold our own in the protection of *all* our markets—including those at home—arrangements will have to be made for the assistance of certain trades and industries which are not directly concerned with an overseas trade. We are not by any means criticising the Report of the Committee. This is admirable and goes much farther than anyone would have expected. But we do suggest that once the principle of industrial banking meets with acceptance, the way is open for a much wider field of activity than is foreshadowed in the Report under discussion.

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The Wright Patents.

There seems to have been some amount of misapprehension in the minds of the Press and public in the matter of the Wright patents. In the course of his Wilbur Wright Memorial Lecture before the Aeronautical Society of Great Britain in June last, Mr. Griffith Brewer made the position clear, as we thought. He stated definitely that the British Wright Co. had compounded its rights—past, present and future—in consideration of a lump sum of £15,000, so far as concerned machines for the Army or the Navy, which, in Mr. Brewer's own words, "is, in fact, the only real market for aeroplanes in Great Britain." That the British Wright Co. was likely to go to the trouble and expense of renewing patents to exploit a market which, in its own view, does not exist, would not to the ordinary intelligence seem likely. The facts of the position were clearly defined in "Flight" of October 16th, 1914, at the time the action against the Government was settled as stated above. At the same time, perhaps it is just as well for the enlightening of the "man in the street" for Mr. Griffith Brewer to be still more explicit, and, in his own words, "call a spade a spade," and thereby dispel any doubt there might exist by reason of his statement at the Wilbur Wright Lecture being "too Balfourian."

Lighting and Public Safety.

To the regulations under the Defence of the Realm Act conferring power on the authorities to require the extinguishment of lights, the following addition has been made :—

"Any such order as aforesaid may contain directions as to public lamps being lighted or kept lighted, and if any public lamp is not lighted or kept lighted as required by the order, any person having control of the lamp for the time being shall be guilty of a summary offence against these regulations."

The British Air Service

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, October 4th.

Leading Mech. D. R. Douglas, Air-Mech. 1st Grade A. R. Willmott, Petty Officer Mechs. W. G. Parry and T. H. Levett, and J. M. Burnett, W. F. Dickson, G. A. Edwards, J. P. Everitt, E. S. Dean, R. V. Britwell and P. C. Richards entered as Proby. Flight Officers for temp. service, all to date Oct. 8th. V. Rhead entered as Temp. Warrant Officer, 2nd Grade, to date Oct. 9th.

Admiralty, October 5th.

Temp. Sub-Lieut. (R.N.V.R.) C. B. Orfeur, appointed to the "President" for R.N.A.S., to date Oct. 8th.

Messrs. E. McD. Wright and J. H. W. Clarke entered as Proby. Flight Officer (temp.), and appointed to the "President" for R.N.A.S., to date Oct. 15th and 8th respectively.

Admiralty, October 7th.

Asst. Paymr. (R.N.R.) F. H. Wakeford entered as Proby. Flight Officer, for temp. service, to date Oct. 6th.

Admiralty, October 9th.

The following Temp. Lieuts. (R.N.V.R.) promoted to Temp. Lieut.-Com. (R.N.V.R.), all with seniority Oct. 5th: L. H. Strain, D.S.C., H. Ingram, C. F. Steele, B. O. Jenkins, W. Park, D.S.C., C. F. Jenkin, C. Kirby, W. A. Briston, F. W. Hodges and F. S. Pilling.

G. H. Childs, P. Swain and A. J. Dronsfield granted temp. commissions as Lieuts. (R.N.V.R.), and appointed to the "President," for R.N.A.S., to date Oct. 7th.

The under-mentioned Temp. Sub-Lieuts. promoted to Temp. Lieut. (R.N.V.R.), all with seniority Oct. 5th: W. H. Reid, G. Gude, R. V. B. Loxley, R. D. Seddon, V. H. Ridewood, H. I. Dear, N. Sladden, D. E. Garnett, A. J. Currie, H. L. Crowther, G. Hindle, C. L. Robinson, A. J. Dreydel, R. A. Allport, C. Horsfield, H. M. Beddall, R. R. Alexander, R. M. N. Perks, F. W. Mansell, E. D. Galloway, C. Lightfoot, J. P. Bourke, H. W. Blake, F. J. Dean, A. T. Lee, D. L. Gillmore, S. T. Baker, F. W. Hill, J. M. Burke, H. Foord, A. Scarrisbrick, F. Smythe, H. C. Mallett, E. H. Bellew, C. G. More, E. C. W. Fitzherbert and J. A. Macnab.

S. Thomas and F. W. R. Martino granted temp. commissions as Sub-Lieut. (R.N.V.R.), and appointed to the "President," additional, for R.N.A.S., to date Oct. 7th.

A. J. Guzner and C. J. Clayton entered as Proby. Flight Sub-Lieuts., for temp. service, and appointed to the "President," additional, for R.N.A.S., to date Sept. 3rd.

Royal Flying Corps (Military Wing).

London Gazette, October 3rd.

Flight-Commander.—Temp. Lieut. J. F. Johnson, Gen. List, from a Balloon Officer, and to be Temp. Capt. whilst so employed; Sept. 13th, 1916.

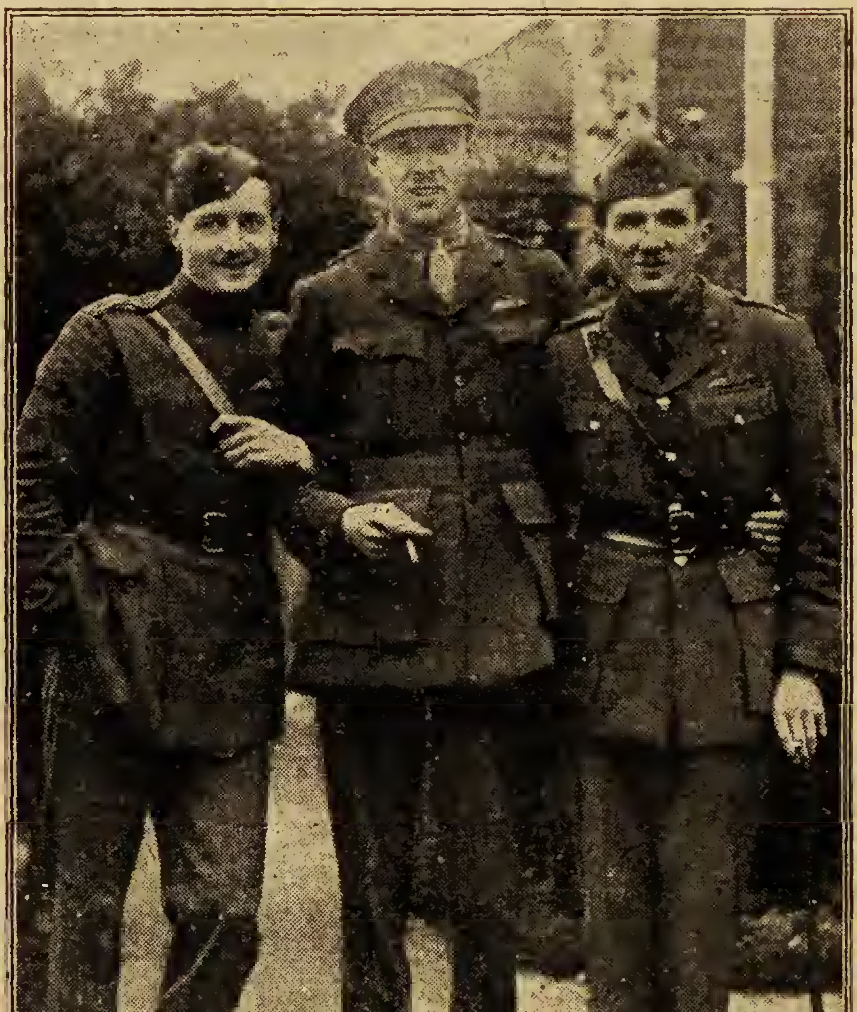
Equipment Officer.—Temp. 2nd Lieut. E. L. Taylor, Gen. List, from an Asst. Equipment Officer, and to be Temp. Capt. whilst so employed; Aug. 1st, 1916.

Flying Officers.—2nd Lieut. J. F. A. Day, Spec. Res.; Aug. 17th, 1916. Temp. 2nd Lieut. J. L. Trollope, Gen. List; Sept. 2nd, 1916. 2nd Lieut. A. B. Drewery, Spec. Res.; Sept. 4th, 1916. Sept. 5th, 1916: Capt. H. A. Hill, Ind. Army; Temp. Capt. G. Taylor-Loban, Durh. L.I., and to be transferred to the Gen. List; Temp. 2nd Lieut. W. G. Nicholls, E. Surr. R., and to be transferred to the Gen. List; 2nd Lieut. V. R. Stewart, A.S.C. Sept. 6th, 1916: Temp. 2nd Lieut. J. P. Alexander, R. Scots, and to be transferred to the Gen. List; 2nd Lieut. H. D. Crompton, W. Lan. Brig., R.F.A. (T.F.); Temp. 2nd Lieut. R. T. Barlow, Gen. List; 2nd Lieut. P. G. Robinson, Spec. Res. 2nd Lieut. G. Barrett, Spec. Res.; Sept. 7th, 1916. Flying Officers (Ob.) who have graduated as Pilots, and been appointed Flying Officers in previous *Gazettes* will take their places on the list of Flying Officer, with effect from the date of their appointment as Flying Officers (Ob.).

Flying Officers (Observers).—April 5th, 1916: Lieut. N. W. Stewart, 7th R. Scots (T.F.); 2nd Lieut. E. King, 3rd K.O. Sco. Bord., Spec. Res., and to be seconded. Sept. 9th, 1916 Temp. Capt. W. H. de W. Waller, A.S.C., and to be transferred to the Gen. List; Temp. Lieut. H. J. Duncan, R.A., and to be transferred to the Gen. List; 2nd Lieut. G. E. Godsave, Lond. R. (T.F.); Temp. 2nd Lieut. E. V. Pemberton, R.A., and to be transferred to the Gen. List. Sept. 11th, 1916: 2nd Lieut. (Temp. Lieut.) R. Spiers, Soc. Rif. (T.F.); 2nd Lieut. (Temp. Lieut.) C. S. Workman, Sco. Rif. (T.F.); Temp. Lieut. R. S. S. Ingram, W. Rid. R., and to be transferred to the General List; Temp. 2nd Lieut. C. Street, Ches. R., and to be transferred to the Gen. List. Sept. 16th, 1916: 2nd Lieut. R. G. R. Allen, W. York. R. (T.F.); Temp. 2nd Lieut. R. Stephenson, Army Cyclist Corps, and to be transferred to the Gen. List; Temp. 2nd Lieut. G. H. Wood, Gen. List.

Assistant Equipment Officer.—Temp. 2nd Lieut. E. E. Castle, Gen. List; April 30th, 1916.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) resign their commissions:—Oct. 4th, 1916: A. G. Stewart, J. J. Dunne, W. L. Winstanley. 2nd Lieut. (on prob.) G. L. Main is confirmed in his rank. The under-mentioned to be 2nd Lieuts. (on prob.): W. F. J. Matthews; Aug. 24th, 1916. Sept. 3rd, 1916: F. J. S. F.



Second Lieut. Sowrey, D.S.O. (on the right), who has received his decoration for recent Zepp. strafing. On the left is Lieut. Robinson, V.C., who brought down the Cuffley airship; and in the centre is Capt. F. R. Stammer.

Feast, J. H. G. Wilson, T. M. Wilson, H. I. Allen, C. E. Oxendale, S. S. Kaye, R. Berl, D. A. Pearson, L. B. Crough and R. G. Watts; Sept. 4th, 1916.

London Gazette Supplement, October 4th:

Experimental Officer (graded as an Equipment Officer).—Capt. R. B. Bourdillon, Spec. Res., from a Flying Officer; June 9th, 1916. (Substituted for the notification in the *Gazette* of Sept. 13th, 1916.)

Flying Officers.—June 21st, 1916: 2nd Lieut. (Temp. Lieut.) W. E. Grosset, Highland Cyclist Bn. (T.F.); 2nd Lieut. (on prob.) E. A. McKay, Spec. Res. Major E. H. M. O'Farrell, R. Ir. Fus., from a Flying Officer (Ob.); June 28th, 1916, with seniority from Oct. 21st, 1915. Temp. 2nd Lieut. J. L. Tibbetts, Gen. List; Sept. 7th, 1916. Temp. 2nd Lieut. G. H. Raitt, Gen. List; Sept. 9th, 1916. Sept. 10th, 1916: 2nd Lieut. A. Rice-Oxley, Shrops. L.I. (T.F.); 2nd Lieut. J. P. C. Mitchell, High. L.I., Spec. Res., and to be secd.; 2nd Lieut. (on prob.) T. Hayes, Spec. Res. Temp. 2nd Lieut. N. R. Pomeroy, Gen. List; Sept. 11th, 1916. Sept. 12th, 1916: 2nd Lieut. G. J. H. Lascelles, S. Mid. (Glouc.) Brig., R.F.A. (T.F.); 2nd Lieut. W. S. Caster, Hunts Cyclist Bn. (T.F.), from a Flying Officer (Ob.), with seniority from April 1st, 1916; Temp. 2nd Lieut. A. J. Fisher, Gen. List; Temp. 2nd Lieut. L. B. Solomon, Gen. List. 2nd Lieut. (on prob.) H. S. Lees-Smith, Spec. Res.; Sept. 13th, 1916. 2nd Lieut. (on prob.) J. S. Mitchell, Spec. Res.; Sept. 14th, 1916.

Memoranda.—1st Class Air-Mech. H. S. Wilkins, from R.F.C., to be Temp. 2nd Lieut. for duty with the Military Wing of that Corps; Aug. 4th, 1916. The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C.:—Sept. 1st, 1916: Chief Petty Officer J. L. Greener, from R.N.V.R.; Pte. F. B. Stevens, from 1st Suss. Yeo. (T.F.); Pte. W. E. Wright, from Inns of Court O.T.C.; Sept. 9th, 1916.

London Gazette Supplement, October 5th.

Squadron Commander.—Capt. H. Wyllie, Wilts. R., from a Flight-Commander, to be secd., and to be Temp. Major whilst so employed; Sept. 1st, 1916. (Substituted for the notification in the *Gazette* of Sept. 25th, 1916.)

Park Commander.—Temp. Capt. F. W. K. Davies, A.S.C., to be transferred to Gen. List, and to be Temp. Major whilst so employed; Sept. 20th, 1916.

Flight-Commander.—2nd Lieut. (on prob.) R. J. Hudson, R. Fus., Spec. Res., from a Flying Officer, and to be Temp. Capt. whilst so employed; Aug. 9th, 1916.

Flying Officers.—2nd Lieut. (on prob.) W. S. Frackleton, Spec. Res.; Aug. 30th, 1916. 2nd Lieut. (on prob.) W. T. B. Tasker, Spec. Res.; Sept. 3rd, 1916. Temp. 2nd Lieut. W. J. Stonier, Bedf. R.; Sept. 5th, 1916. Lieut. J. C. F. Owen, Canadian A.S.C.; Sept. 6th, 1916. Sept. 7th, 1916: 2nd Lieut. P. F. Heppell, Northumbrian Brig., R.F.A. (T.F.); 2nd Lieut. H. J. Finer, Home Counties Divl. R.E. (T.F.); 2nd Lieut. (on prob.) M. J. Fenwick, Spec. Res.; Temp. 2nd Lieut. V. B. Allen, Gen. List; Temp. 2nd Lieut. G. H. Cock, Gen. List; Temp. 2nd Lieut. C. E. Ward, Gen. List. Sept. 11th, 1916: Temp. 2nd Lieut. O. J. Wade, R. W. Kent R., and to be transferred to the Gen. List; 2nd Lieut. (on prob.) G. H. Lee, Spec. Res.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) W. H. Douche resigns his commission; Oct. 6th, 1916. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank:—F. H. Gay, B. James, R. W. Cross, R G Fordham, G. W. Dampler, W. M. Kent, N. B. Lovemore, T. A. B. Rolfe, G. H. Foley. The under-mentioned to be 2nd Lieuts. (on prob.): A. L. Challis; Aug. 22nd, 1916. Aug. 27th, 1916: E. M. Leete, R. M. Ward. Aug. 31st, 1916: L. Davies, J. W. Parkinson. L. M. Van Eyssen; Sept. 1st, 1916. H. Fuller-Clark; Sept. 3rd, 1916. G. W. Longstaff; Sept. 10th, 1916. J. R. Taverner; Sept. 18th, 1916. R. L. Lyster-Smythe; Sept. 25th, 1916.

London Gazette, October 6th.

Equipment Officer.—The rank of 2nd Lieut. E. L. Taylor, Gen. List, is as now described, and not as in the *Gazette* of Oct. 3rd, 1916.

Experimental Officer (graded as an Equipment Officer).—The date of appointment of Lieut. (Temp. Capt.) B. M. Jones, R.E. (T.F.), is June 9th, 1916, and not as in the *Gazette* of Sept. 13th, 1916.

Flying Officers.—July 3rd, 1916: 2nd Lieut. (on prob.) E. R. Yates, Spec. Res.; 2nd Lieut. (on prob.) E. D. Spicer, Spec. Res.; 2nd Lieut. H. A. Hallam, York. and Lanc. R., Spec. Res., and to be secd.; Sept. 13th, 1916. Sept. 14th, 1916: Temp. Lieut. N. W. Wickham, R. Lanc. R., and to be transferred to Gen. List; Temp. 2nd Lieut. H. R. Davies, R.E., Spec. Res.; 2nd Lieut. H. W. Girdlestone, R.A., and to be secd.; 2nd Lieut. G. H. Foley, Spec. Res.; 2nd Lieut. (on prob.) W. D. Thom, Spec. Res. Sept. 15th, 1916: Capt. D. V. J. Blake, Australian Flying Corps; 2nd Lieut. (on prob.) J. V. A. Gleed, Spec. Res.; 2nd Lieut. R. W. Cross, Spec. Res. Sept. 16th, 1916: Capt. H. J. Segrave, Wilts. R., and to remain secd.; 2nd Lieut. R. G. Fordham, Spec. Res. 2nd Lieut. (Temp. Lieut.) A. H. Orlebar, Beds. R. (T.F.); Sept. 17th, 1916. The appointment of Temp. 2nd Lieut. P. W. M. Orme, notified in the *Gazette* of Aug. 24th, 1916, is antedated to June 18th, 1916.

Assistant Equipment Officers.—July 10th, 1916: 2nd Lieut. E. J. Street, 2nd Lieut. H. Jones, 2nd Lieut. J. H. Winch. (Substituted for the notification in the *Gazette* of Aug. 8th, 1916.) 2nd Lieut. W. Park, Spec. Res.; Sept. 4th, 1916.

Memorandum.—Feb. 14th, 1915: 2nd Lieut. (on prob.) A. Roberts, from R.F.C., Spec. Res., to be Temp. 2nd Lieut. on Gen. List, for duty with R.F.C.; Aug. 15th, 1916.

Supplementary to Regular Corps.—The appointment of 2nd Lieut. (on probation) L. F. Bennett, notified in the *Gazette* of July 27th, 1916, is antedated to June 21st, 1916. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: M. J. Fenwick, W. S. Frackleton, J. S. Mitchell, G. H. Lee, W. T. B. Tasker, C. E. Blayney, S. W. Taylor, C. H. Vincent, J. D. Stodart, H. Thompson, F. H. Sanders, F. G. Seabrooke, R. T. Vernon, T. Hayes, C. J. Pender, A. J. McWha, H. B. Burrell, C. Elphinstone, H. J. Whittingham, P. Young. W. Park to be 2nd Lieut.; Sept. 4th, 1916. The under-mentioned to be 2nd Lieuts. (on prob.): W. P. Bingham; Sept. 1st, 1916. F. H. Postlethwaite; Sept. 9th, 1916.

London Gazette Supplement, October 7th.

The under-mentioned N.C.Os. and men to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.: Pte. J. Phillips, from A.S.C.; Aug. 31st, 1916. Sept. 3rd, 1916: Sergt. W. J. Reid, from A.S.C.; Corpl. C. H. Blakeway, from R.F.C. Pte. J. H. McLennan, from Can. Inf.; Sept. 6th, 1916. Corpl. C. E. Wilson, from Lond. R.; Sept. 7th, 1916.

Flight-Commander.—Capt. G. Disney, Essex R.; Sept. 25th, 1916, but with seniority from June 1st, 1916.

Flying Officers.—2nd Lieut. C. R. Keary, N. Staff. R., and to be seconded; Sept. 15th, 1916. Sept. 16th, 1916: Temp. 2nd Lieut. (Temp. Lieut.) J. L. M. de C. Hughes-Chamberlain, Gen. List, from a Flying Officer (Ob.), with seniority from May 6th, 1916; Temp. 2nd Lieut. N. F. W. Rockey, Gen. List; Temp. 2nd Lieut. A. Denison, R. W. Surr. R., and to be transferred to Gen. List; 2nd Lieut. W. A. M. Niven, Spec. Res. Sept. 17th, 1916: Lieut. F. V. Woodman, Canadian Gen. List, from a Flying Officer (Ob.), with seniority from April 1st, 1916; 2nd Lieut. R. S. Larkin, Spec. Res. 2nd Lieut. F. H. Gay, Spec. Res.; Sept. 18th, 1916.

Assistant Equipment Officers.—Sept. 4th, 1916: 2nd Lieuts., Spec. Res.: R. J. Cowan, C. H. Boyle, R. A. Hassard. Temp. 2nd Lieut. L. H. Aston, Gen. List.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. for duty with R.F.C.: Chief Petty Officer L. H. Aston, from R.N.A.S.; Aug. 7th, 1916. Staff-Sergt. F. Green, from N.Z. Exped. Force; Sept. 25th, 1916. The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: L.-Corpl. G. M. J. Denman, from R. Suss. R. (T.F.); Aug. 28th, 1916. L.-Corpl. J. Wingate, from Herts. Yeo. (T.F.); Aug. 31st, 1916. Pte. D. M. Mackie, from Inns of Courts O.T.C.; Sept. 11th, 1916. Sept. 24th, 1916: Pte. B. O. Butler, from Canadian A.S.C.; Regtl. Qr.-Mr.-Sergt. E. H. Hooper, from 3rd Co. of Lond. Yeo. (T.F.); Sergt. A. L. Johnson, from Lond. Elect. Engrs., R.E. (T.F.). The under-mentioned, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Military Wing of that Corps: Flight-Sergt. H. Dear; Sept. 24th, 1916. 1st Class Air-Mech. W. G. Ruggins; Oct. 1st, 1916.

Supplementary to Regular Units or Corps.

Royal Flying Corps, Military Wing.—2nd Lieut. (on prob.) W. S. Roberts is dismissed the Service by sentence of a General Court-Martial; Sept. 16th, 1916. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: G. L. Rodwell, W. A. M. Niven, R. S. Larkin, J. E. Histed, N. E. S. Simon, W. D. Thom, J. V. A. Gleed, P. H. Smith, N. H. Read, H. E. Martin, E. D. Spicer, J. R. Hembrough. The under-mentioned to be 2nd Lieuts. (on prob.): H. J. Taplin; Aug. 17th, 1916. A. D. Robertson; Aug. 27th,

1916. H. E. Jarman; Sept. 24th, 1916. H. B. D. Grazebrook; Sept. 24th, 1916.

London Gazette Supplement, October 9th.

Flying Officers.—Sept. 13th, 1916: Lieut. G. C. Rogers, Canadian Gen. List; Lieut. R. G. Macnaughton, R. Highrs. (T.F.), from a Flying Officer (Ob.), with seniority from May 26th, 1916; 2nd Lieut. (on prob.) J. H. Broadway, Dorset R., Spec. Res., and to be secd. Sept. 15th, 1916: Temp. 2nd Lieut. D. E. Hood, Bedf. R., and to be transferred to Gen. List; Temp. 2nd Lieut. G. R. A. Deacon, R. Suss. R., and to be transferred to Gen. List; 2nd Lieut. E. A. Clark, Spec. Res. Temp. 2nd Lieut. J. H. O. Jones, Gen. List; Sept. 16th, 1916. 2nd Lieut. J. E. Histed, Spec. Res.; Sept. 17th, 1916. Sept. 18th, 1916: Temp. Lieut. L. Dodson, S. Staff. R., and to be transferred to Gen. List; 2nd Lieut. C. L. Roberts, S. Lan. R., Spec. Res., and to be secd.; 2nd Lieut. E. Elgey, W. Rid. Brig., R.F.A. (T.F.); 2nd Lieut. H. E. Martin, Spec. Res.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Sergt. A. L. Pearce, from 1st Mounted Divl. Sigl. Sqdn., R.E. (T.F.); Sept. 11th, 1916. Corpl. R. C. Carline, from a Training Res. Bn., Middx. R.; Sept. 16th, 1916. Corpl. F. J. Cunningham, from Canadian Red Cross Hosp.; Sept. 17th, 1916. Sept. 24th, 1916: L.-Corpl. H. Newns, from A.S.C.; L.-Corpl. C. H. Stafford, from Berks. Yeo. (T.F.); Pte. G. G. Onions, from A.S.C.; Sept. 30th, 1916.

Supplement to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. A. Clark, M. A. Chappell, T. G. Mackenzie, A. C. Hartley, R. P. C. Freemantle, F. E. Hobley, D. W. Wilson, H. G. Welsford, A. W. Payne, F. M. Howard, D. Smith, E. E. Glorney, L. G. Poole-Warren, J. N. Stephens. The under-mentioned to be 2nd Lieuts. (on prob.): A. E. Biggs, A. W. Barlow; Aug. 31st, 1916. H. J. G. Dyer; Sept. 10th, 1916. Sept. 17th, 1916: C. H. Stevens, A. Graham. Sept. 18th, 1916: R. N. Vyvyan, H. C. Sharp. B. V. N. Rowcroft; Sept. 21st, 1916. R. G. Whitcomb, G. E. Quincey, W. D. Scott; Sept. 30th, 1916.

Kite Balloon School of Instruction.

London Gazette Supplement, October 7th.

Commandant (graded as a Squadron Commander).—Temp. Capt. A. H. Parker, Gen. List, from a Flight Commander, vice Capt. G. Disney, Essex R.; Sept. 25th, 1916.

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THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

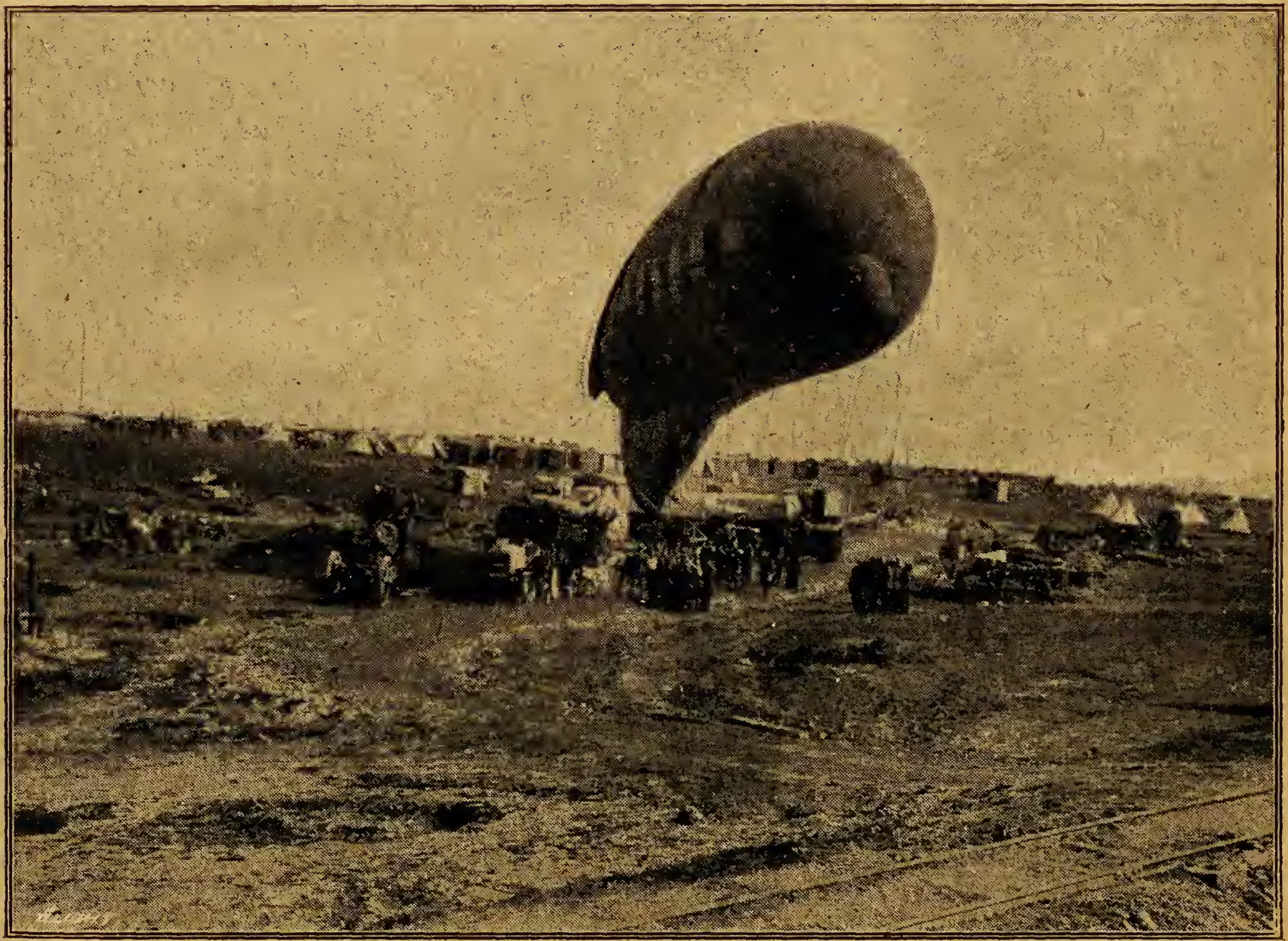
The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Oct. 3rd, 1916 ..	10,853	11	7
Collected at the Westland Aircraft Works, Yeovil (Fifty-first contribution)	0	14	10
Total, October 10th, 1916	10,854	6	5

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.



(*Official photo. issued by the Press Bureau.*)

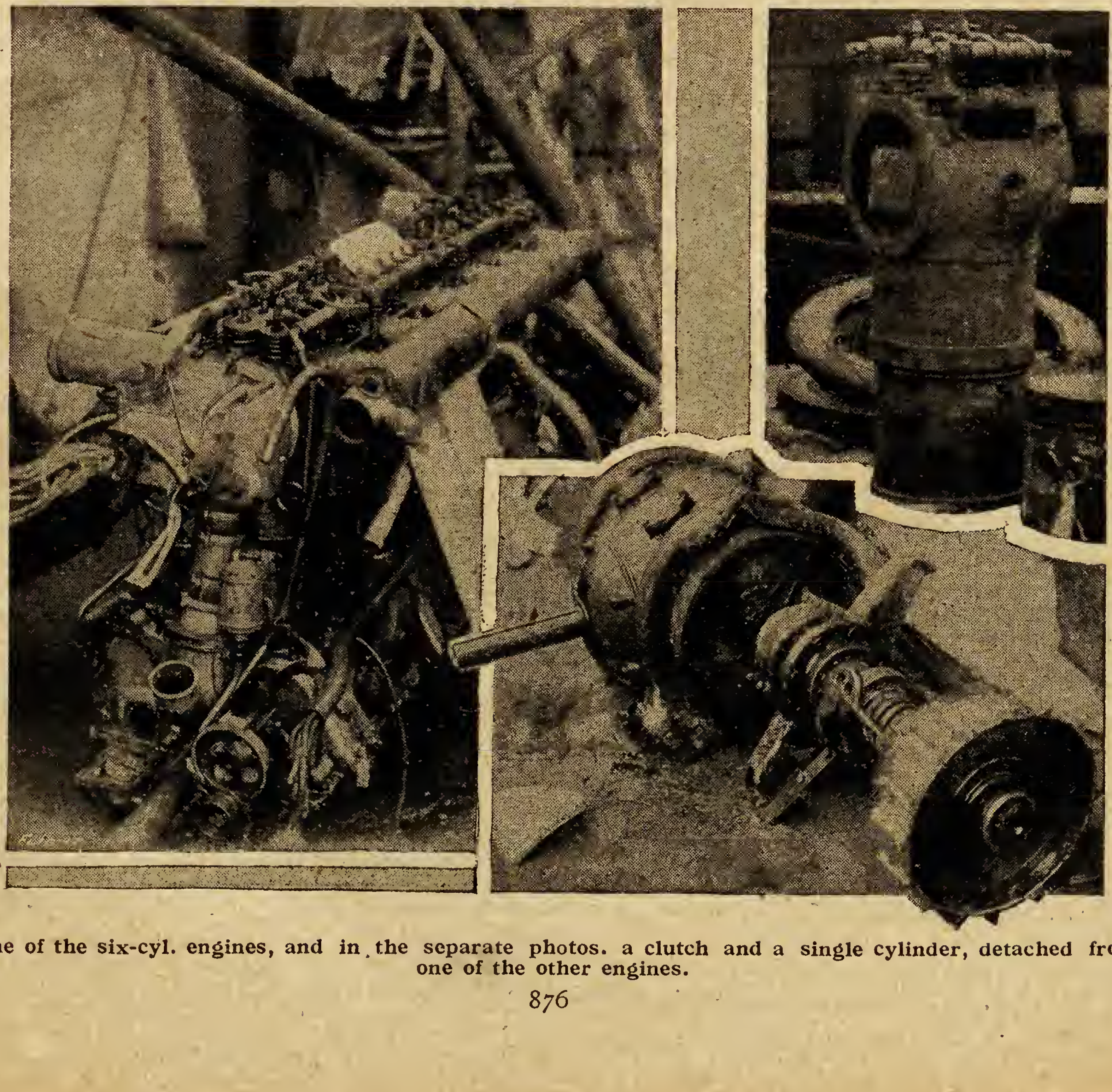
HUT LAND, ON THE FRONT IN FRANCE.—An observation balloon going up.

THE HUN RELICS AT THE H.A.C.

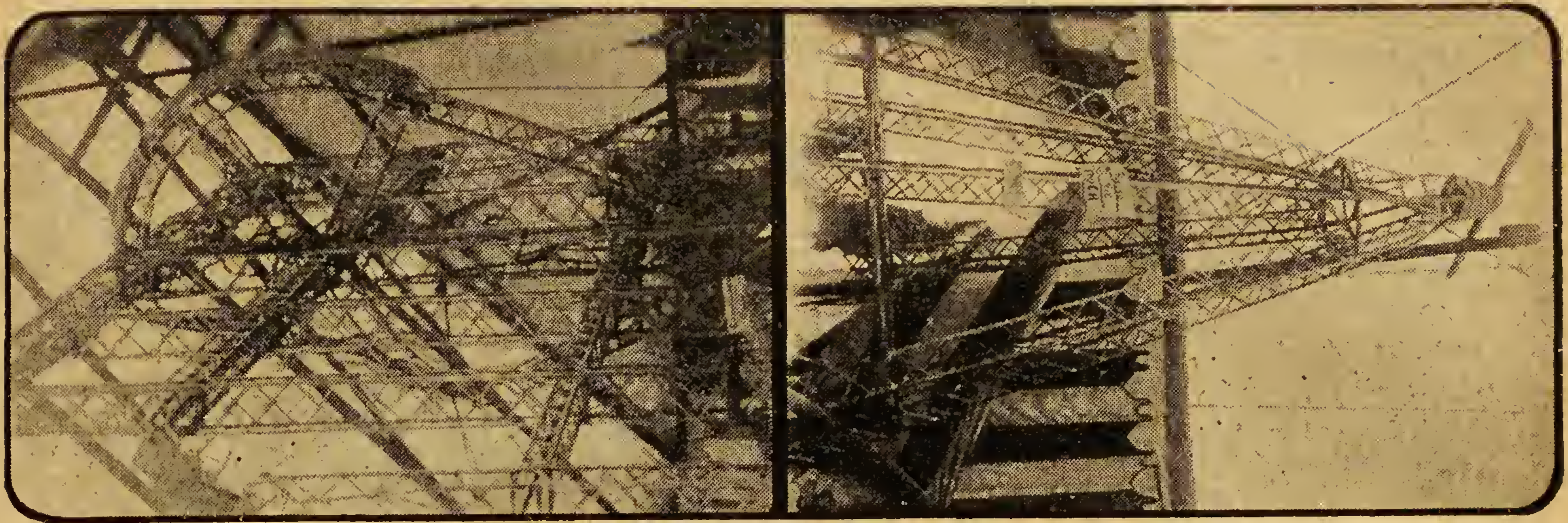
If Germany had made up her mind in the early days to give the Schütte-Lanz firm the same encouragement as was accorded the aged Count Zeppelin, it is highly probable that we in this country should now know a great deal less about German airship construction than we do, for whatever may be said for and against the two forms of construction, there can be no doubt that the Schütte-Lanz method has this great advantage, from the German point of view, that when brought down in flames little of any practical value is left to give information calculated to be of use to the enemy. Such items as engines, gondolas, propellers with their transmission, &c., are generally not battered beyond recognition, but of the main framework hardly enough is left wherewith to start a fair sized kitchen fire, let alone form any decided opinion of size and shape. Not so with the Zeppelin type of airship. Except for the fact that building a replica entails making a complete set of working drawings, there is no reason why we should not now be able to start work immediately on a similar craft were we so minded. When three airships of practically the same type have come to grief it requires extraordinarily bad luck for the same part to get smashed up in all three wrecks, and by taking the uninjured, or nearly so, parts of one and combining them with the intact portions of the other two, there is really not a great deal that eludes detection.

Although only a small portion of the wreckage of the Zepp. brought down in flames in Essex is shown at the H.A.C. grounds, Finsbury Pavement, a very good idea may be formed, from these only, of the general method of construction followed in the building of a modern rigid airship. One of the first things noticed when examining the various girders is, that instead of the old method of building up a beam which consisted chiefly in alternating vertical and sloping pieces connecting the flanges of the beam, the X formation is now almost entirely employed. Generally speaking three types of beams appear to be employed, according to the work to be done at that particular place. For the heavier stresses a rectangular section beam is used, built up of four L section *longerons* connected with crossed members, as shown in the accompanying sketches. For the heaviest kinds of work it appears that the web pieces cross one another twice, although only one of the intersections is used for attaching the two parts of the cross to one another. The second way of joining the ends of the crosses to the flanges is that of only partly crossing the ends in such a manner that one rivet secures two members to the flange, each member being, in addition, fastened to the flange with another rivet. The sketches, which were made from memory and which do not lay claim to being more than diagram, will, however, serve much better to give an idea of the construction than is possible in a written description. The third type of girder referred to is built up similarly to the others, with the exception that this is of triangular instead of rectangular section. These are used towards the stern of the airship, a conical portion of which was shown.

Generally speaking, an inspection of the fragments gives one the impression that all the smaller component parts of the beams have been standardised as far as possible, and are, in fact, stampings turned out by the thousands. By far the most expensive operation in the construction is the assembling and erecting, which must be a lengthy process even with latest riveting machinery. Each individual beam seems to have been very well thought out and constructed, but when it comes to putting two members such as—to use

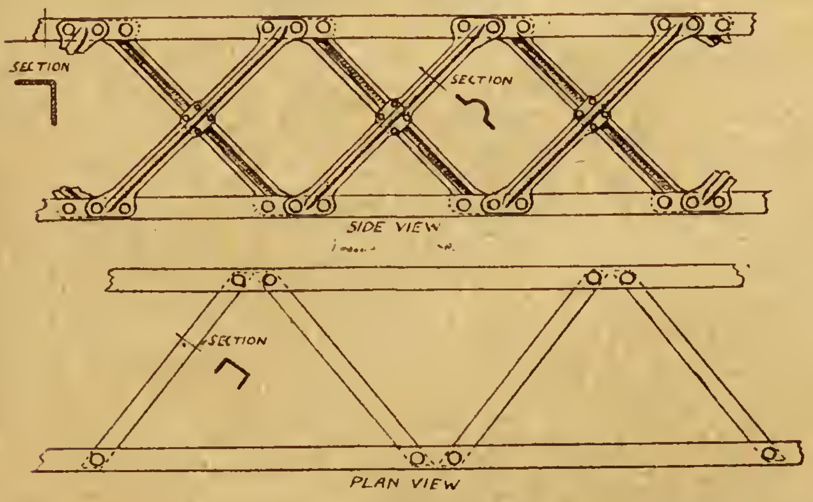


One of the six-cyl. engines, and in the separate photos. a clutch and a single cylinder, detached from one of the other engines.



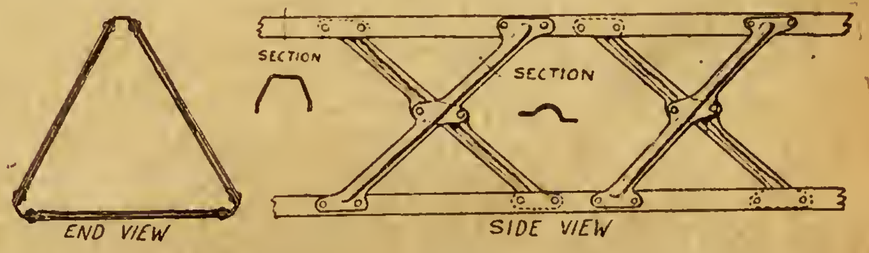
ZEPPELIN CONSTRUCTION.—On the left the framework of an elevator, and on the right the conically shaped tail of the girder structure. When on exhibition the latter was upended, but we have placed it as it would be were the airship cruising.

terms known from aeroplane construction—formers and stringers together, this appears to have been left to the workmen to do as best they might, some doing it one way and some another. The locking together of the various beams where they meet or cross others appears exceedingly clumsy, and shows no trace of clever design. In connection with the main framework it should be mentioned that the alloy employed does not appear to be made from the same constituents as in earlier types, having a decidedly "tinny" sound when lightly tapped. Also in appearance it looks different from duralumin, being less white, and looking in fact more like tin than aluminium. An analysis of the alloy would probably reveal the nature if not the proportions of the various ingredients.

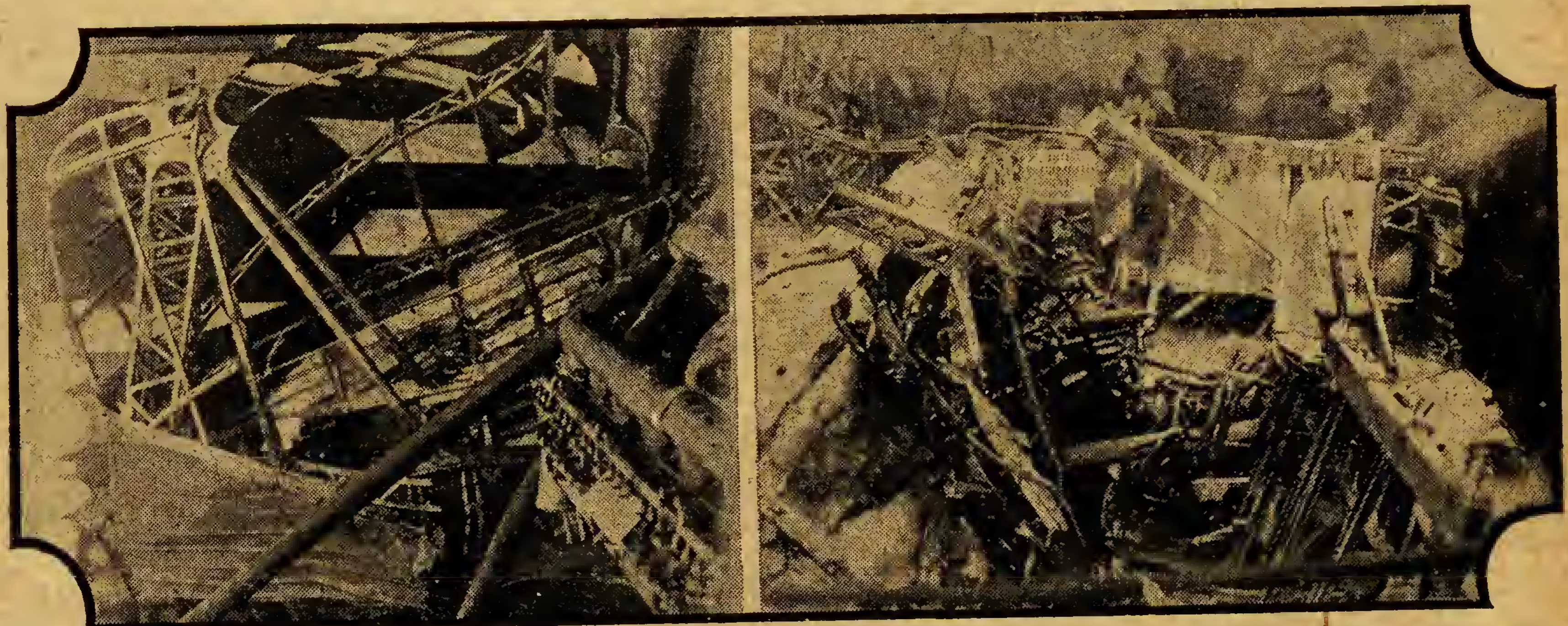


ZEPPELIN GIRDER CONSTRUCTION.—For the heavier loads beams of rectangular section are employed. Also the riveting is slightly different.

The gondolas appear to have been built up in a similar fashion, only that they are covered with a corrugated sheeting of the same alloy. Wood appears to be entirely absent in the construction, and the greatest care in reducing the danger of fire is everywhere noticeable. Two gondolas have evidently each carried one engine driving, *via* a clutch and gear-



ZEPPELIN GIRDER CONSTRUCTION.—For the lighter loads a beam of triangular section is used, the method of construction being clear from the sketch.

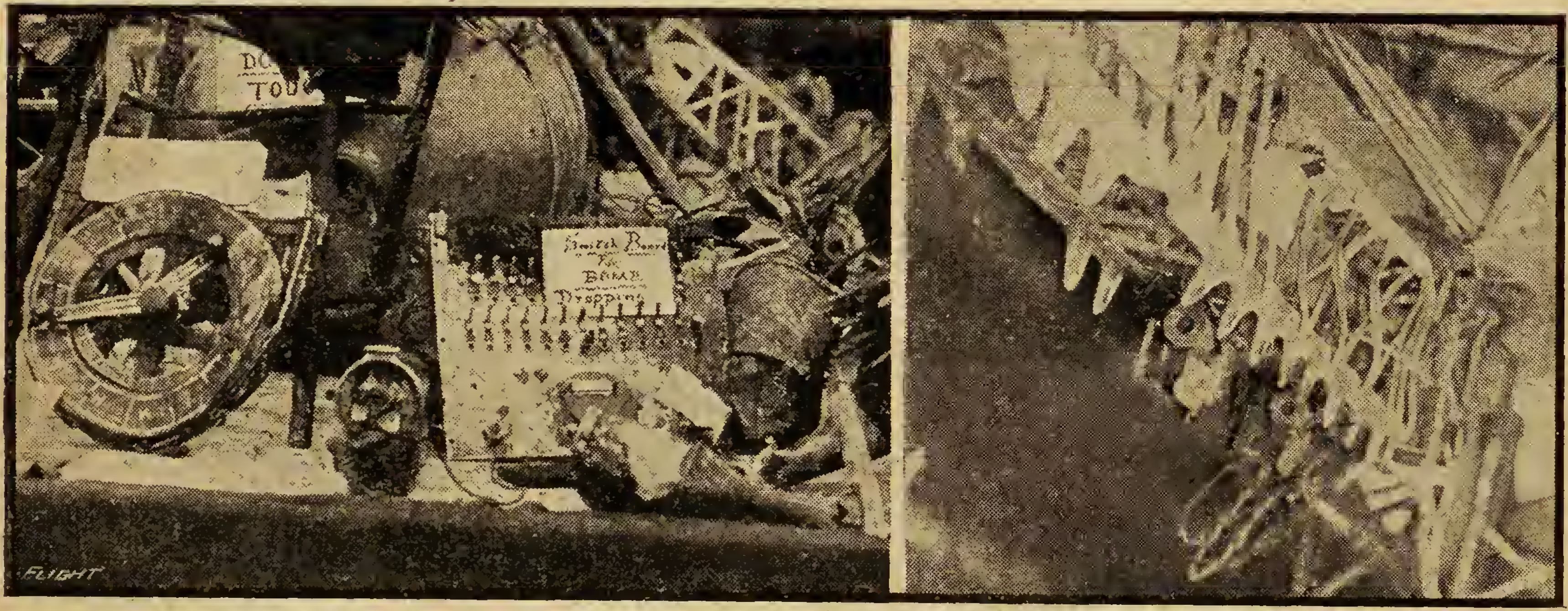


TWO BADLY "STRAFED" GONDOLAS.—On the left the remains of what appears to have been one of the end cars with a single engine driving a propeller, the boss of which can be seen protruding in the left-hand corner. The car shown on the right appears to have accommodated two engines driving the side propellers through bevel gearing.

box, an air screw placed at the rear of the gondola, a large thrust bearing transmitting the push of the screw to the framework through diagonal compression struts. Two more propellers were mounted on tubular brackets under the belly of the main hull, each driven by an engine in a third gondola, through bevel gearing. These side propellers, in addition to their ordinary functions, are evidently used for ascending and descending, giving, according to the direction in which they are rotated, an upward or downward pull. The gear-boxes are provided with two speeds forward and two reverse, so that considerable flexibility in manœuvring is obtained.

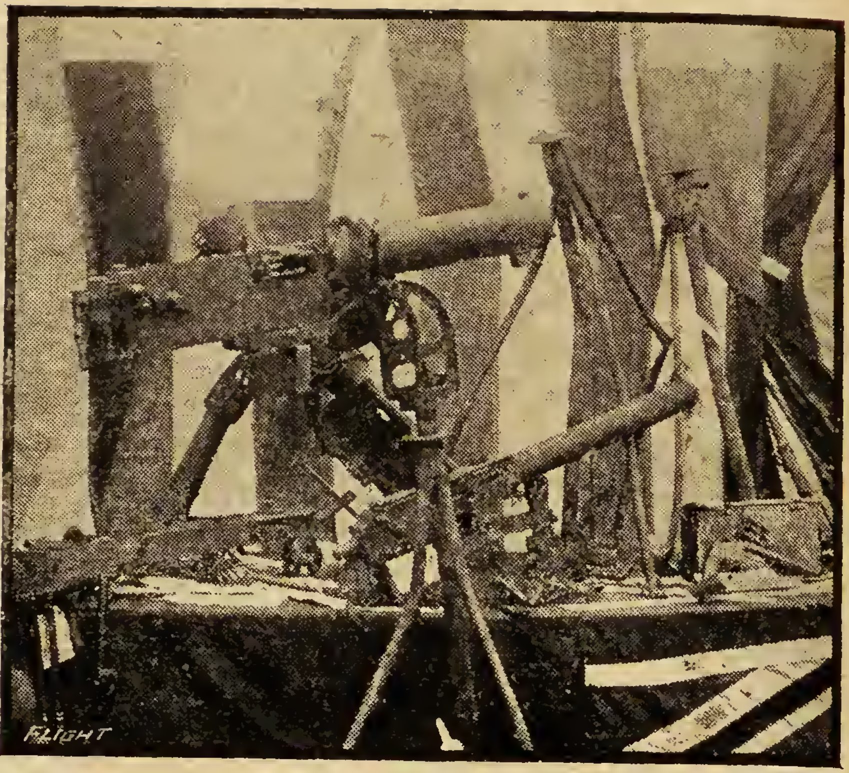
Among the items of special interest may be mentioned the engine-room telegraph shown in one of our photographs. It is a circular disc divided up into sections bearing various inscriptions such as—Laterne ein (Searchlight on), Laterne aus (Searchlight off), Leer (Idle), Halb (Half), Voll (Full), Alle Kräfte (All out); while corresponding to some of these are the engine revolutions running up to 1,500, corresponding to the "All out" indication on the outer section, and which therefore appears to be the maximum revolutions of which the engine is capable when under load.

Next to the engine-room telegraph on a table is the switchboard operating the dropping of bombs. There are on this board 26 switches, this number therefore indicating the number of bombs carried, or, at any rate, the number of bombs ready in position for dropping, and judging from the method of mounting the bombs it appears unlikely that "reloading" is possible while in the air. On a long and rather heavy beam which appears to have formed a sort of keel are a number of bomb release devices, consisting of an electro-magnet with its armature, and of a small hook. When a current is passed through the winding of the electro-magnet by closing the corresponding switch on the switchboard in the commander's cabin, the armature is drawn towards the magnet, and by its movement releases the catch of the hook from which the bomb depends, thus releasing the latter. It would appear that the bombs are slung from this keel girder in a long row, the release mechanisms being connected up to the switches in such a manner that throwing over the first two switches releases the front and rear bombs, and working in this way towards the centre so as to not upset the fore and aft trim of the airship.



In the left-hand photo. is shown: On the left, the engine-room telegraph, and on the right the switchboard from which the bomb-dropping is controlled. The right-hand picture shows two of the electrical bomb releases mounted at intervals along a long girder, and operated from the switchboard in the left-hand picture.

The engines, of which several are on view, some from the airship brought down at Cuffley and some from that which fell in Essex, are all of the same type, *i.e.*, six-cylinder vertical developing—we should say some 250 h.p. each. Overhead valves are used, of which there are five in each cylinder, two inlet and three exhaust valves. The mixture enters through one long straight induction pipe drawing the gas from two carburettors, one at each end of the engine. The carburettors are aluminium castings bolted to the opening in the end cylinder corresponding to the cooling-water passages in the sides of each cylinder, a watertight joint between which is formed by rubber rings. The cooling water is allowed to circulate round the carburettors, thus helping to heat the mixture before it enters the induction pipe. On the exhaust side the water circulation includes the exhaust pipe which is surrounded by a water jacket. Wire gauzes are inserted at all points where a flame might possibly escape, and every precaution is taken to guard against fire. The method of holding down the cylinders is very neat and simple, and consists in yokes between adjoining cylinders gripping a portion of the flange at the bottom of each cylinder and secured by long bolts, one on each side, passing down to the sides of the main bearings of the crankshaft so that the explosions put no strain on the crankcase itself. Dual ignition is provided, two magnetos being mounted on one end of the engine, one on each side and driven from the cam-shaft on that side. There are two sparking plugs to each cylinder—one on each side—one magneto serving the plugs on one side and the other the plugs on the opposite side. There is therefore little prospect of ignition trouble, since should one fail the other continues to fire the plugs on the other side.



Some machine guns from the wrecked airship, with their mountings and ammunition.

Although not one of the chief attractions, a captured L.V.G. biplane was of considerable interest. It tallied in every respect with the machine described in our issue of June 22nd this year, the scale drawings of which were done under great difficulties, being, in fact, done by a special method of perspective which "Flight" has developed. It was gratifying to find that all the dimensions tallied with those found by us. The machine described had a 160 h.p. Mercedes engine, while the one on view at the H.A.C. grounds was fitted with a 160 h.p. Benz. A Lang propeller had replaced the original German one, but that, of course, was not noticed by the majority of the visitors.

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THE ROLL OF HONOUR.

Reported by the Admiralty:—

Killed (Accidentally).

Po. 15757 F. W. G. Taylor.

Missing.

Flight Sub-Lieut. A. J. Chadwick, R.N.

Previously reported Missing, now reported Prisoner of War in Turkey.

Flight-Com. G. B. Dacre, D.S.O., R.N.

Slightly Wounded.

F. 2363 G. Holloway.
F. 2381 G. B. Hughes.
F. 10126 T. G. Shepherd.
F. 3005 R. H. Whiting.

Reported by the War Office:—

Killed.

2nd Lieut. C. H. M. King, R.F.C.

Previously reported Wounded, now reported Died of Wounds.

Capt. K. A. Brooke-Murray, A.S.C., attd. R.F.C.

Previously reported Missing, now reported Killed.

Lieut. E. C. Jowett, R.F.C.

Previously reported Missing, now reported Died of Wounds as Prisoner of War in German hands.

Lieut. R. Burgess, Army Cyclist Corps, attd. R.F.C.

Died of Wounds.

2422 2nd Air-Mech. C. E. Norman, R.F.C.
5569 Corpl. D. B. Walker, R.F.C.

Wounded.

2nd Lieut. C. H. Bell, R.F.C.
2nd Lieut. F. C. Biette, R.F.C.
2nd Lieut. L. V. Drake, Yeomanry and R.F.C.
Capt. A. W. Field, Mach. Gun Corps, attd. R.F.C.
Lieut. R. V. Franklin, R.F.C.
2nd Lieut. R. S. Haward, R.F.C.
2nd Lieut. A. F. Livingstone, R.F.C.
2nd Lieut. G. Philippi, Dragoons, attd. R.F.C.
2nd Lieut. C. P. V. Roche, R.F.C.
2nd Lieut. N. E. S. Simon, R.F.C.
2nd Lieut. B. V. S. Smith, R. Warw. R. and R.F.C.
Capt. P. E. Welchman, R.E. and R.F.C.
9206 2nd Air-Mech. J. Howcroft, R.F.C.
7971 2nd Air-Mech. G. G. Taylor, R.F.C.

Previously reported Missing, now reported Wounded and Prisoner of War in German hands.

Lieut. J. G. Robertson, R.F.C.

Previously reported Prisoner of War, now reported Wounded and Prisoner of War in German hands.

2nd Lieut. J. H. Firstbrook, R.F.C.

Missing.

Lieut. B. T. Coller, R.F.C.
2nd Lieut. S. Dendrino, R.F.C.
2nd Lieut. A. T. Easom, R.F.C.
2nd Lieut. F. St. J. F. N. Echlin, R. Fus., attd. R.F.C.
Capt. D. B. Gray, Indian Infantry, attd. R.F.C.
Lieut. E. E. Lansdale, A.S.C. and R.F.C.
Lieut. J. H. Lowson, R. Scots, attd. R.F.C.
2nd Lieut. T. E. G. Scaife, Dragoon Gds., attached R.F.C
2nd Lieut. H. A. Taylor, R. West Kent and R.F.C.
1864 Sergt. J. E. Glover, R.F.C.
3389 Sergt. B. Irwin, R.F.C.

Previously reported Missing, now reported Prisoners of War.

10387 2nd Air-Mech. T. N. Robinson, R.F.C.
1746 Sergt. G. Topliffe, R.F.C.

* * *

Improvement in the Russian Flying Services.

At the Staff here, writes the *Daily Telegraph* correspondent at Petrograd, the gratifying statement is made that during the recent fighting in Galicia the Russian air service has had great successes, not only widening the sphere of its activity, but even changing its character as a military instrument. As on the Western Front, so here the aeroplane has ceased to be merely a means of scouting, and is becoming ever more and more a fighting weapon for use in the very thickest of the fray. This news is all the more welcome, because until lately the air service was one of the weak spots in Russia's military equipment.

Bigger German Anti-Aircraft Guns.

According to the *Echo de Paris* a tendency has been observed among the Germans to strengthen seriously their air services as well as to increase the size of their anti-aircraft guns. With their 5-in. guns, which have a range of 8½ miles, fusing (? incendiary) shells succeed from time to time in reaching our machines.

Funerals of the Burnt Zepp. Crews.

The bodies of the 22 Germans who perished in the Zeppelin which came down in flames in Essex on September 24th were buried on September 27th. The coffin of the commander bore the inscription, "Commander Brodruck, killed on service, September 24th, 1916." According to the *Kreuzzeitung* he was Naval Lieut. Karl Brodruck, a son of Lieut.-General Georg Brodruck, and possessed the Iron Cross of the First and Second Class.

On the 5th inst. the 19 bodies recovered from the wreck of Zeppelin L31, brought down at Potters Bar on October 1st, were buried at the local cemetery alongside those who perished in the destruction of L21 at Cuffley. The coffin of the commander bore a brass plate with the inscription "Commander Mathy, died on service, October 1st, 1916." At the inquest on the preceding day it was stated in evidence that a tablet on the body of the commander bore the inscription "Kptln. Mathy, L31." The verdict was to the effect that death was due to injuries received whilst travelling in a hostile airship. The evidence showed that none of the victims were alive when found.

A Missing Zepp. Commander.

A report, under date October 6th, from Constance, asserts that the commander of the last Zeppelin brought down in England was named Bernhard Schreib-Mueller, who for his earlier exploits had been decorated with the Iron Cross of the 1st and 2nd Classes and the Bavarian and Hanseatic medals. Before entering the Army he was an officer of the Lake Constance Navigation Co. Possibly this refers to the commander of the Zeppelin wrecked near the Essex Coast.

Another Zepp. Commander Killed.

According to one of the latest German casualty lists, Naval Lieut. Werner Peterson, commander of a naval airship, has been killed in action.

More Zeppelins Reported Wrecked.

Fishermen arriving at Esbjerg last week reported that at midday on October 2nd they sighted a partly submerged Zeppelin about 35 miles north-west of List, on the Island of Sylt. The airship was surrounded by German torpedo-boat destroyers, and two larger vessels were on either side of the envelope attempting to keep the airship afloat.

According to reports from Amsterdam a Zeppelin, apparently returning from England, was seen on October 2nd about 5.30 a.m. over the Frisian village of Zwaagwesteine with the cigar-shaped stern end missing. Part of a cabin appeared to be projecting beyond the flat end. Its course was very erratic.

In its issue of October 4th the Dutch paper *Les Nouvelles* stated that it was in a position to affirm that in the French aerial attack on Mannheim on September 22nd bombs fell on one of the principal hangars and destroyed a Zeppelin, 230 metres long, fitted with eight engines. A gas reservoir standing on the aerodrome was also hit and exploded. The paper adds that to prevent news of the disaster getting abroad the town has been isolated till October 10th.

Armchair Reflections

by the "Dreamer".

Once, in the dear old days when we had winters, in England, I had occasion to send for a plumber. He came with his mate, and they stood and looked at the job for a few breathless moments the while I stood by awaiting the verdict, for all the world like a criminal awaiting a decision for or against me. We stood a little to one side to avoid getting wet, and then the verdict was pronounced. "Yes," he said, "it certainly is a burst." And the mate concurred. Then one went back for the tools.

I could never understand why when one sends for a plumber he always comes without tools, and I had the temerity to ask this one. "How do I know," he answered, "what tools I shall want until I have seen the job?" Inspiration must come when a plumber looks at his job, or is it the laying out of the tools in a neat row that leads on to a knowledge of what to do?

A writer has no tools except his pen, and looking at his job is worse than useless. Sometimes when I look at the sheets needing covering to form this page, I could wish I were a plumber.

If I had a bass or a carpet bag full of tools, it appears to me that the job would be easy. Inspiration would come with their handling, but what can one do with but a pen? It is possible that I have the wrong kind of pen. There is one, I believe, known as the Facile pen. Mine is of the common variety known as Fountain, and at times it won't "fount" worth a ha'penny squirt.

No doubt but that those who write the "Woman's Page" in our daily journals have a very facile pen, and a heavily gold-mounted one at that. I have a page before me in which the writer touches on everything interesting to women, from the proper costume to wear when the Zepps. come, to the market price of sweet potatoes.

It is whispered in journalism that in many instances "Auntie" or "Cousin Alice" is a man in disguise. If that be true, he has my deepest sympathy for that which he has to do, and my entire and unalloyed appreciation of the way he does it.

Yet I think in this instance it is one of the gentler sex who wields the facile pen. It appears to me that this sentence gives the clue. "After every raid one hears stories of the sketchiness of the costumes displayed by ladies *en route* for cellars and safety."

Now the place where men hear "stories," Zepp. and otherwise, is generally the Club, and no man, at anyrate no Nice Man (as our woman writer would put it) ever recounts to his friends stories of how the women folk of his establishment dress when they bolt for a seat among the best Wallsend. Apart from that, the costumes, or lack of them, hurriedly donned in such trying moments, do not as a rule lend themselves to artistic description. I think the ladies who lay in special costumes of the "chic" variety on purpose for Zepp. raids, must reside in boarding houses. There are wonderful possibilities in a boarding house. "Cellars and safety," indeed. Valenciennes lace and blue tieups and coal dust and a pair of strong arms and a pretty little thing who knows just when to cry and be afraid, is an explosive mixture and does not make for safety.

But about these costumes. Here is a description. It is called a "jumper frock," but whether it is so called because one jumps out of bed or jumps into it, or because the wearer is preparing to jump somebody's claim, I do not know. "It is made of beautiful materials, and nothing is considered too costly for its decoration." I hope my lady readers will forgive me, but it does appear that women have no niggardly hand when they put capital into a promising investment.

"Another novelty is the Jumper Pyjama, made of black crêpe de chine (I am quoting) with a flesh-coloured blouse." This, it says, "has been specially created to meet the how-to-dress-when-the-Zepps.-are-about-problem." Words fail me. There is no comment.

The same writer says, "A personal friend of mine however, may be described as being over-costumed on Saturday last. She appeared in the road, not only quite decently clad in pyjamas, but with the additional glories of white stockings, black boots, and grey silk (the word is hers) bloomers." Again I find evidence that the writer is a woman. No mere man would be able to see pyjamas, white stockings, and, er, the other things, all at one time. I did once see a man of the London Scottish, home on leave, run out in pink and white striped pyjamas and a kilt, but that was probably from habit. Judging from their costumes, ladies must take some little time to make up for the part.

However, it was the facile pen I started out to write about. Writing a little lower, of housing the working classes to be exact, she holds forth thusly. "Let there be no brass to polish, no horrid little flowers and leaves in bas-relief . . . no panels to the doors. Give the women nice deep sinks. Coppers with taps above them, and movable insides that can be lifted out and . . ." but why more of this? I simply wanted to show versatility, and what could be more versatile than to be able to write of crêpe de what-you-may-call it and a movable inside? And to show pluck, she concludes, "If the builders want any more useful hints they may write to me."

Failing any possibility of my ever becoming a plumber, I wish I had a Facile pen.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

R. W. P. (S. Farnborough) sends us the following query :—

"What is the 'liner of the air' likely to be like as regards design and speed ? A liner that would carry a hundred passengers ?"

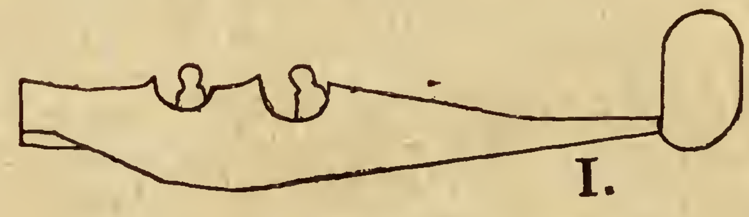
This is really looking ahead, and we pass the question on to our readers. *The Sphere* has reproduced some very fascinating designs in this direction.

P. H. B. (Rothley).

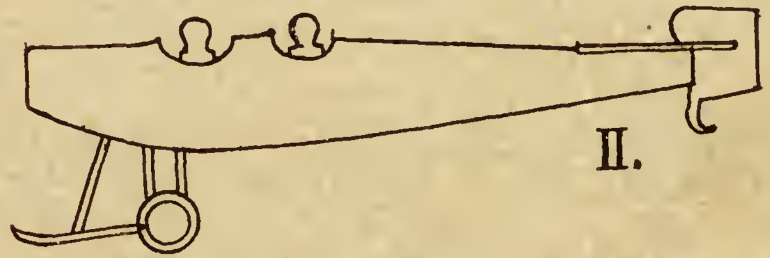
The thrust obtainable with a given engine depends on the propeller efficiency and the translational speed of the aeroplane. Approximate estimates may be made by assuming a certain propeller efficiency and substituting in the formula $P = \frac{550 \times H \times Ep}{V}$ where H = brake-horse-power of engine, Ep = efficiency of propeller, expressed as a decimal, and v = translational speed of the aeroplane in feet per second. A fair propeller efficiency to assume is 75 to 80 per cent., expressed in the above formula as ·75 and ·80 respectively. The *nacelle* of a "pusher" biplane is not included among items in the slip stream, being in front of the air screw. There is no fixed relationship between the area of main planes and the area of tail plane, as this depends on several factors. In modern machines the area of the tail planes varies from about one-sixth to one-tenth of that of the main planes. This figure includes both fixed tail plane and movable elevator flaps. In his book on "Aeroplane Design," Capt. F. S. Barnwell, R.F.C., suggests that the ratio of elevator area to tail plane should lie between the limits of ·6 to ·4 and ·3 to ·7, as outside these limits the machine will be either heavy on the controls or slow to respond.

C. B. (Wolverhampton).

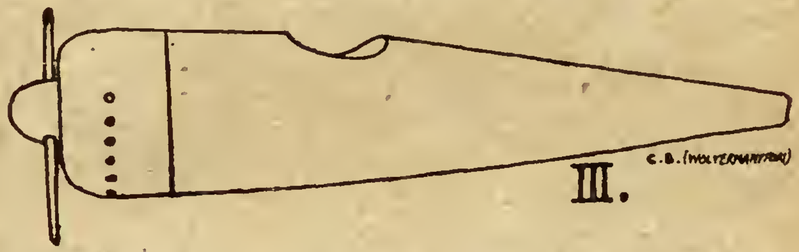
It is impossible to give exact figures regarding the resistance of aeroplane bodies or *fuselages*, as this varies considerably according to size and shape. In the accompanying sketches are shown three different shapes of bodies, the resistance of which was determined by—No. I, the N.P.L. ; No. II, by J. C. Hunsaker and D. W. Douglas at the Massachusetts Institute of Technology ; and No. III, by Mons. G. Eiffel. The models are of different sizes so that it is difficult to provide proper comparison between them. The length of body No. I is not stated, but it was made to $\frac{1}{10}$-in. scale, and tested at a velocity of 30 ft./sec. = about 20·5 m.p.h., at which velocity the resistance was 0·0165 lbs. This gives a resistance for the full-size body at 100 m.p.h. of 97·6 lbs. with rudder. It is reasonable to assume a length of 20 ft. A model of body No. II to $\frac{1}{12}$-in. scale was tested at a velocity of 30 m.p.h., when the resistance was 0·1365 lbs. The resistance of the full-size (24·5 ft. long) body, *with tail planes and undercarriage*, is 218·4 lbs. at 100 m.p.h. No. III is a model of a Deperdussin *monocoque* body to $\frac{1}{5}$-in. scale and was tested at a wind velocity of 28 metres/sec., when the resistance was 0·377 kilog. This gives a resistance of the full-size body (14 ft. long) of 52·16 lbs. at a speed of 100 m.p.h. These results were obtained with the engine cowl in place and with the propeller held stationary. When the propeller was allowed to act as a windmill, driving the engine round, the resistance was considerably greater. As already mentioned, these experiments do not afford any ready comparison, as the bodies tested differ not only in shape but also in size, while one is fitted with undercarriage and tail planes, another with engine and propeller, and a third with rudder only.



I.



II.



III.

They may be of use, however, in a general way, to give an approximate estimate of body resistances.

R. H. (Brixton).

When the engine of an aeroplane stops during a flight the machine proceeds to descend by the action of gravity. For instance, if a machine is said to have a gliding angle of 1 in 8, it means that if the weight of the aeroplane is = W, its resistance to horizontal motion (at a certain speed) is $= \frac{W}{8}$, and that therefore it will, if the engine is stopped, glide down a slope of 1 in 8.

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New Rank in the R.F.C.

A RECENT Army Order states that the titles of Equipment Officers and Assistant Equipment Officers in the Royal Flying Corps will in future be Equipment Officer, 1st Class, and Equipment Officer, 3rd Class, respectively. A new grade of Equipment Officer, 2nd Class, is also constituted with pay at the rate of 18s. a day, which includes flying pay.

Fatal Accidents.

AT the inquest on October 4th on Flight-Lieut. Cyril Donald Jenkins, of Swansea, who was killed while flying, the evidence showed that engine trouble occurred while he was ascending. The jury found that death was due to shock.

An inquest was held on October 9th on the body of Second Lieut. Harold Baker, R.F.C., a Canadian, who was killed on the previous day. The evidence showed that from a height of 2,000 ft. the machine dived sharply with the engine working. When climbing after the dive the machine collapsed and fell, the pilot being killed instantly. The accident was attributed to the excessive speed caused by the dive. A verdict of "Accidental Death" was returned.

Zepp. Sheds in Belgium.

REPORTS from the Belgian frontier state that the Germans have considerably enlarged their airship hangars at Antwerp. The Maastricht newspaper, *Les Nouvelles*, reports that the last British air raid on Brussels was particularly successful in its attack on hangars at Berchem Ste. Agathe. One hangar was demolished. A cordon of German troops is now guarding the approach to it. Access to the neighbourhood is absolutely forbidden.

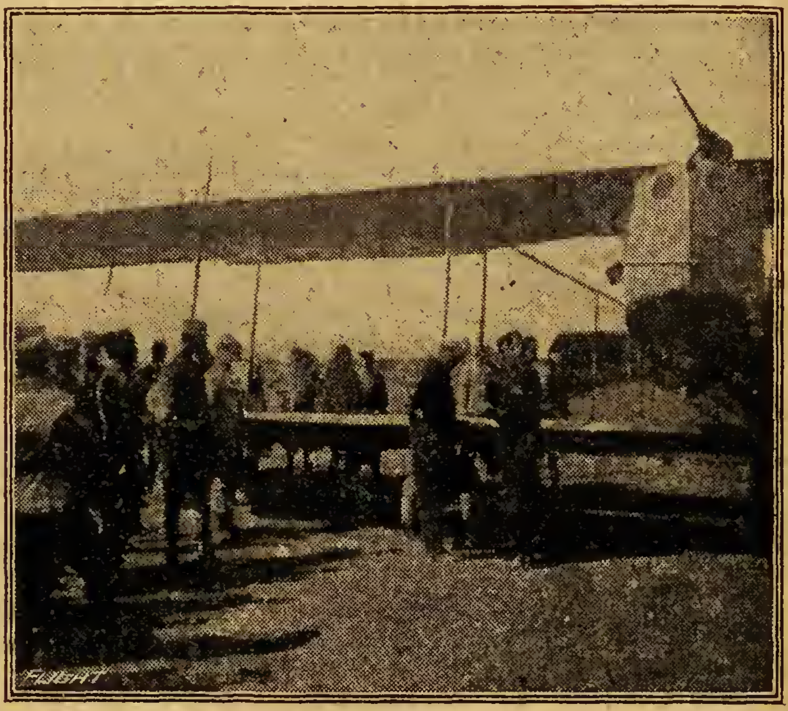
More Flyers from Australia.

A CABLE message from Melbourne states that, in addition to the monthly reinforcements for the squadrons already abroad, further recruits are being enrolled in the Flying Corps in Australia.

AIRISMS FROM THE FOUR WINDS

HUN "frightfulness" in the air is apparently not so novel an idea as most folk have ventured to think, judging by a caricature, dating from 1784, which has been dug up by a correspondent of the *Westminster Gazette.* In this old print the French inventor of the fire-balloon, Montgolfier, is shown blowing bubbles, and, in the usual facile way of inventors, prophesying great things of his project. The legend reads: "O by Gar! dis be de grand invention. Dis will immortalise my King, my Country, and myself. We will declare the war against our Enemie: we will make des English quake, by Gar! We will inspect their camp, we will intercept their fleet, we will set fire to their dockyards, and, by Gar, we will take Gibraltar in de air-balloon. And when we have conquer

A portrait of Sous-Lieut. Louis Noel taken by his observer, Lieut. Leseur, whilst crossing the Danube during his great flight to Bucharest.



A snapshot at Bucharest taken immediately after Louis Noel landed.

An interesting group taken four days before Louis Noel's flight across Bulgaria. Reading from left to right: Sous-Lieut. Louis Noel, Lieut. Maire, Chief d'escadrille, and Lieut. Leseur, Noel's observer.

de English, den we conquer de other countries, and make them all colonie to de Grand Monarque." Count Zeppelin should be terribly upset to find that, after all, his methods have been anticipated, if only by suggestion.

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THE great lighting—or is it darkening—problem is still breaking new ground in all sorts of ways. By way of experiment the Wandsworth Highways Committee propose extinguishing for a period of a month all street lamps in the borough at 10 o'clock at night.

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" GERMANY claims to have 80 Zeppelins, and that she can build two each month.

" Britain has proved that on the average she can bring down one Zeppelin a week.

" Working on these figures, how long will it be before the entire Zeppelin fleet is destroyed ? "

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THE above is a problem recently set school children by their teachers, after having read Lord French's first report on a Sunday night's raid in an area fairly familiar with Zepp. visitors. Complete answer after Peace terms are fixed up.

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ZEEBRUGGE Lighthouse appears to be the beacon light which helps to guide home and serve as a rallying point for the Zepp. raiders after their jaunts over British soil. A little special attention to this prominent object of the " landscape " from our air services might be worth consideration.

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IN the United States there appears to be much excitement over the U-boat campaign adjacent to American waters. It certainly does bring the European conflict a bit close home to the nation which is too proud to fight. There is plenty in the episode for our " Cousins " to ponder, as to its effect upon their own naval program—one *m*, please, and no *e*. And in their pondering they must not forget to include adequate provision for naval units in more than one ocean, as if the Panama Canal existed not. For has not the advent of aviation practically nullified any increased efficiency which their fleet was to have by its use ? It is difficult enough now to keep the channel open from landslides. What a few super-aeroplanes could effect in the way of helping Nature in this direction can be left to the imagination of future generations.

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PERHAPS after all, though, the Wilson " proudness " is not quite understood by the older nations, as the President now affirms—election stunting is in full blast across the herring-pond just now—that " America is as ready to fight as any nation, but the cause must be just. After the war America must join the league of nations to preserve the peace of the world." Possibly President Wilson has not yet heard officially of the " just cause " of Belgium. If it were not all so tragic it really would be screamingly funny.

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MR. F. W. LANCHESTER has decided to issue another book on things aviatic, entitled " The Flying Machine from an Engineering Standpoint." It can hardly be deemed a new work, as the main basis of the contents will be the author's " James Forrest " Lecture which he delivered in abstract before the Civil Engineers before the War—to wit, on May 5th, 1914. The volume is to be issued immediately by Messrs. Constable and Co., and the publishers point out that this publication derives its importance as being a definite pronouncement as to the technical and scientific position of scientific knowledge so far as concerns the heavier-than-air machine at a date just prior to the outbreak of war. The volume will also include Mr. Lanchester's paper which he contributed to the Engineering Congress of San Francisco in 1915.

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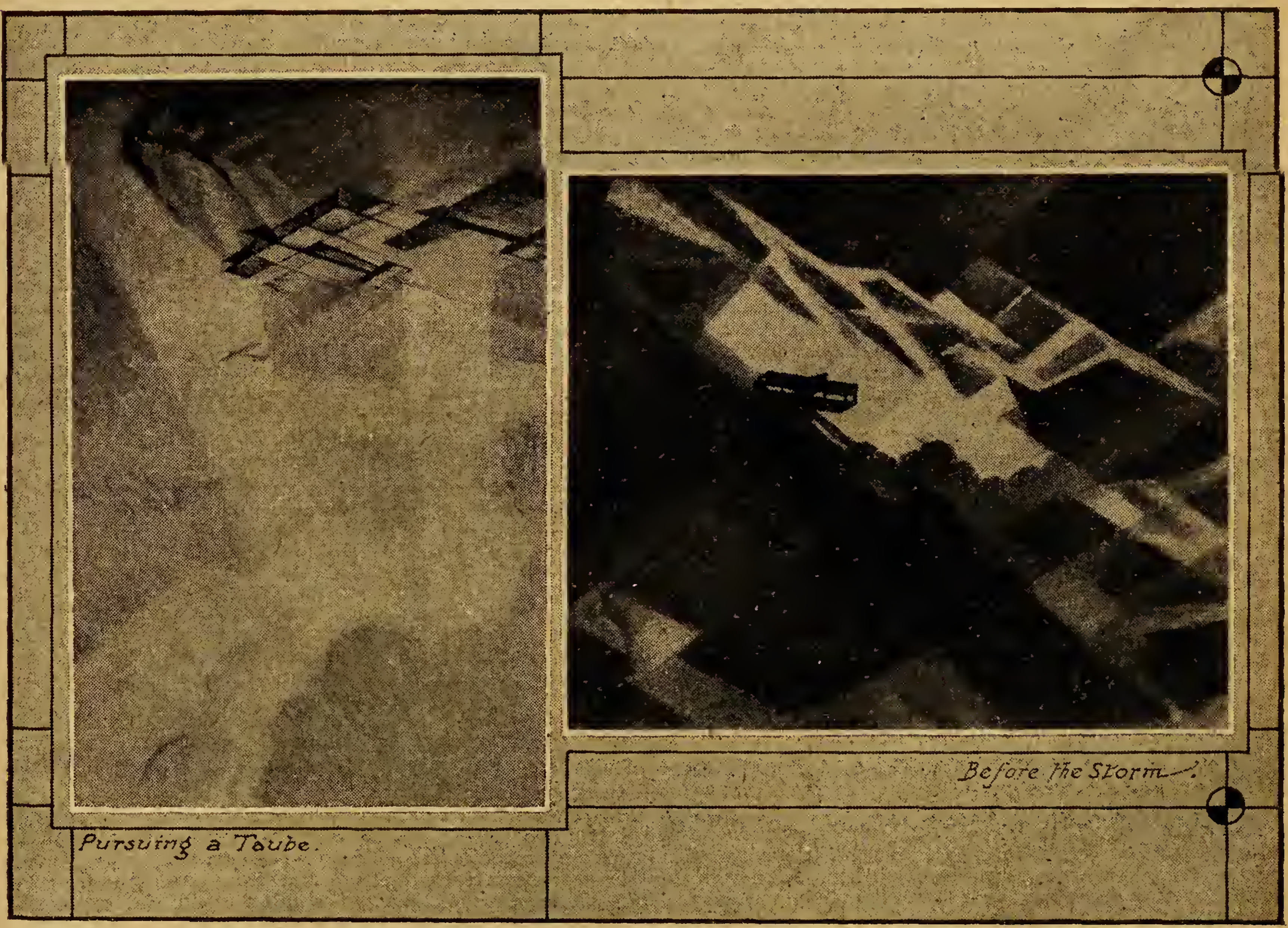
AT Bow Street the other day Walter Schulchess—sounds like a good old British name—manager of the Corner House



Pursuing a Taube.

Before the Storm—!

Two remarkable war pictures by C. R. W. Nevinson (late R.A.M.C.), now on exhibition at the Leicester Galleries, Leicester Square. (*Reproduced by permission of the proprietors of the Leicester Galleries.*)

Restaurant in Coventry Street, was fined £5 for an offence at the said establishment against the lighting regulations on September 22nd.

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£5 or 31 days—why 31, we wonder—was the well-merited punishment meted out by the West Ham magistrate on Arthur Thomas Oxford, a Canning Town boilermaker, for spreading a false report about "a big fleet of airships coming over to-night." The laying of him by the heels was a smart piece of work on the part of a "Special."

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In view of the large amount of ash used in aeroplane construction, it has been suggested that "Hearts of Ash" would be an appropriate aero-nautical ditty in the years to come.

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The War Office has presented an Albatros aeroplane to Cambridge University.

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It may be of interest to note, in connection with the construction of the latest Zeppelins, that although these are started in Germany, they are finally finished in England.

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Atlantic City from above by moonlight is one of the latest thrills provided for air-trippers, for Aviator Beryl H. Kendrick, who has already demonstrated the success of such a plan, has made arrangements for carrying out a series of these flights with his airship.

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Miss Marjorie Stinson, who hitherto has been flying Wright biplanes, made her first flight in a tractor biplane—the 50 h.p. Brock—last month in quite finished style. In future she intends using this machine for exhibition work.

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Walter L. Brock, by the way, is building a Morane-Saulnier-type monoplane, with which he hopes to put up "some" exhibition flying.

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When invited to come for a flight, Miss Laura Anderson, of Montreal, consented on condition that she could carry on knitting socks for soldiers, and so, piloted by S. T. Meyerhoffer, the industrious young lady knitted away serenely as they flew over the city. At least, so the story goes.

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According to the *Revue des Produits Chimiques*, analysis of the metal parts of the Zeppelin brought down in Paris recently showed that the constituents were as follows: Angle brackets—aluminium 90·27 per cent., zinc 7·8 per cent.; channel members—aluminium 88·68 per cent., zinc 9·1 per cent.; bracings—aluminium 99·07 per cent., zinc ·13 per cent. A small quantity of other ingredients consisted of copper, tin, manganese, iron, nickel and silicon.

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In an "expert's" aviation article in a contemporary, it is stated: "We cannot imagine that Lieut. Robinson's exploit caused the Hun any serious mental agitation, for, lacking definite news, he was prepared to accept the loss of the *non-rigid aeroplane*, wrongly and absurdly described by our authorities as a Zeppelin, as a piece of sheer ill-luck." This even tops the description in the same "weakly" of a J.A.P. engine as one of Japanese make.

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Amongst the cards bearing such words as gondola, engine, radiator, &c., at the exhibition of Zepp. relics, was one inscribed "Silencer," and having in the corner a minute object. Closer view discovered one of these indiarubber comforters for babies. English designers may make drawings and take measurements. Who was the joker?

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It is a pity something better in the way of design could not have been thought out for the badge of the R.F.C. Observer. It is a lop-sided looking affair, and causes a brave body of men to be known as "Onewingers."

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In a London suburb is a row of 12 houses, each let to two families, perhaps a hundred humans in all. Opposite is waste ground. A bomb fell 15 yards in front of the middle houses, more or less altering the shape of the whole row! Not only was nobody killed, but none were injured. Just a severe fright or so, that's all.

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A short while ago one of our staff tried for the tenancy of a villa in Essex, but the landlord would only sell. Standing empty it came to grips with a bolt from the blue, fairly and squarely. Good luck!

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal) of October*, 1906. "Flight" *was founded in* 1908.

The Gordon-Bennett Balloon Race.

The start of the 17 balloons for the great Aerial Derby, as it has come to be called, which took place on Sunday afternoon last in the Tuileries Gardens, Paris, was in every way a success from a spectacular point of view. The weather was delightful, the numbers of spectators enormous and enthusiastic, and the organisation was so perfect that each competitor was started off at the right moment with the regularity of clockwork, while military bands enlivened everybody and gave a holiday atmosphere to the proceedings.

Some excitement was occasioned by nothing being heard of the Hon. C. S. Rolls till some of the later evening papers came out on Tuesday evening, when it emerged that he had eventually landed near Sandringham after a satisfactory but not particularly exciting voyage.

The results were subsequently announced as follows:—(1) "United States," 400 miles; (2) "Elfe," 370 miles; (3) "Walhalla," 294 miles; (4) "Britannia," 287 miles; (5) "Zephyr," 212 miles; (6) "Ville de Chateauroux," 206 miles; (7) "Montana," 200 miles.

Count Zeppelin's further Success.

It is with real satisfaction that all who take an interest in the navigable airship will learn that recent experiments at the Lake of Constance with the Zeppelin airship proved most satisfactory. This great vessel is now furnished with Daimler motors supplying 85 h.p., and has proved so much more manageable than on any previous occasion, that future trials are to be conducted not only over Lake Constance, which has hitherto been for safety's sake the scene of the airship's manœuvres, but also are to be undertaken over land. The airship, which is said to have attained speeds of 45 kiloms. per hour, started from Manzell on the Wurtemburg side of the lake, proceeded in the direction of Constance, and when close to the shore at that point ran down the south-western shore of the lake to Arbon, and then struck nearly due north back to Friedrichshafen, and from there coasted round the short distance—nearly 70 kiloms.—to the starting point.

Major Gross, Optimist.

The successful performance of the Zeppelin airship, amongst other results, has been productive of a lecture by Major Gross to the International Aeronautic Federation, held in the Charlottenburg High School. In his observations, Major Gross maintained that "the principle of construction for airships is now absolutely clear. That there is no further question of inventing an airship, but merely of actually constructing one." Well, of course, it is all a matter of what one means by invention. Even Major Gross admits that steering arrangements are not at present absolutely ideal, though how far they are to be brought into an ideal condition except by the exercise of further invention is not quite plain.

Hun "Frightfulness" in a New Phase.

At a meeting of the Executive Committee of the Navy League, on Tuesday, the following resolution was unanimously adopted:—

"The Executive Committee of the Navy League has heard with profound concern that the German Military Authorities propose to hold a court-martial on British airmen who are alleged to have been found with 'tracer' bullets in their possession; if the fact be as stated the Navy League demands that similar treatment shall be promptly meted out to the crews of German Zeppelins now prisoners of war in England with whom 'tracer' bullets have been found when raiding airships were recently brought down in this country."

German Aerial Losses.

In addition to Lieut. Wintgens, Germany has recently lost three pilots who have figured prominently in Headquarters *communiqués*. They are Lieuts. Mutzer, Muller and Schwartzkopf, each of whom had been given the Order of Merit for their exploits. According to the *Cologne Gazette*, Wintgens was attacked from behind when flying at 12,000 ft., and a bullet struck his petrol tank, which caught fire, and the machine fell to the ground wrapped in flames.

PERSONALS

Casualties.

Lieutenant Donald Beck, R.F.A., attached R.F.C., reported killed, joined the Motor Cycle Corps (Territorials) on August 5th, 1914, and after a month obtained his commission in the Royal Field Artillery. In May, 1915, he went to Egypt, and thence to Salonica, and at the beginning of 1916 he joined the Royal Flying Corps as an Observer, in Egypt. He came home in June, and passed the first part of his pilot's certificate with distinction, and was completing his flying courses when he met his death on September 21st. He was the only child of Commander O. L. Beck, R.N., and Mrs. Beck.

Second Lieutenant John Hampson Dodgshon, Surrey Yeomanry and R.F.C., son of the late Edmund Dodgshon, of Manchester, was killed on October 1st whilst flying over England, at the age of 25. He was educated at Westminster, and was a member of the school cadet corps. He joined the H.A.C. in July, 1913, and played Rugby football for the corps. He went abroad with the H.A.C. in September, 1914, and spent the first winter of the war fighting in Flanders and France. He was invalided home, and on his recovery was gazetted a commission in the Surrey Yeomanry. He served for six months in Egypt, and was at the Dardanelles' as Assistant Military Landing Officer. On his return to England he declined a post as Assistant Equipment Officer in the Royal Flying Corps, as he felt he ought to take a more active part in the war. He obtained his "wings" last August, and was made an instructor.

Second Lieutenant Cyril Henry Marshall King, R.F.C., who fell on September 30th, was the youngest son of the Rev. E. G. King, D.D., Rector of Gayton, Northamptonshire. He was educated at the Preparatory School, Sherborne, Aldenham, and Birmingham University, where he studied engineering and gained a scholarship for research in his final B.Sc. examination. When the war broke out he enlisted in the Universities and Public Schools Brigade, and afterwards obtained a commission in the R.G.A. He went to the Front in 1915, transferred after some months to the R.F.C., and was gazetted as an Observer. Last June he came to England for his pilot's course, and he returned to the Front in August.

Captain Keith Lucas, Sc.D., F.R.S., R.F.C., Fellow of Trinity College, Cambridge, has died as the result of injuries received in a collision of aeroplanes on October 5th. A correspondent of the *Times* writes: "He had already acquired a world-wide reputation as one of the most promising physiologists of the younger generation. The older methods of research have in certain directions ceased to be fruitful; they are no longer adequate to settle the problems which present themselves. These problems require not only an intimate knowledge of physiology, but a most delicate command of instrumental methods. In designing instruments for investigation and in ability in handling them Keith Lucas stood alone." Dr. Lucas, who was born in 1879, was the son of Francis Robert Lucas, and was educated at Rugby and Trinity College, Cambridge, of which he became a Fellow in 1904. He was elected F.R.S. in 1913, and was invited to give the Croonian Lecture to the Royal Society even a year before his election to it. Before the war he was fully engaged in both teaching and research work at Cambridge, and was, moreover, one of the directors of the Cambridge Scientific Instrument Co. But on the outbreak of war all this was put aside in order that he might devote his rare instrumental skill and inventiveness to the Air Service. As testimony to his success we quote the following from the report of the Advisory Committee for Aeronautics as published in the *Times* of August 9th last: "A close study of the conditions affecting the aeroplane compass, with a view to its development and improvement, was undertaken at the Royal Aircraft Factory by Dr. Keith Lucas, F.R.S. As a result a type of instrument specially adapted for employment on an aeroplane under the varying conditions which arise in flight was ultimately produced and standardised. This is the R.A.F. Mark II compass, which is now being made in large numbers. Flyers are much indebted to Dr. Lucas for the success attained in this investigation." But the compass was by no means his only achievement, and he became more and more engrossed in the work as time went on. Dr. Lucas married, in 1909, Alys, daughter of the Rev. C. E. Hubbard, and leaves three sons.

Second Lieutenant Philip J. Smyth, Connaught Rangers, attached R.F.C., killed in action, was a son of Mrs. Bridget Smyth, Kinawley, Co. Fermanagh.

Married and to be Married.

A marriage has been arranged between Captain (Temporary Major) Cuthbert Euan Charles Rabagliati, King's Own Yorkshire Light Infantry and R.F.C., M.C., younger son of Andrea C. Rabagliati, M.A., M.D., of Whinbrae, Ben Rhydding, Yorks, and grandson of the late Duncan McLaren, M.P. for Edinburgh, and Monica, only daughter of Joseph Child Priestley, K.C., of Tatmore Place, Hitchin, and granddaughter of the late Sir William Overend Priestley, M.D., of 17, Hertford Street, Mayfair, and M.P. for Edinburgh and St. Andrews Universities.

An engagement is announced between Captain Alexander W. Ruthven Stuart, Gordon Highlanders and R.F.C., younger son of the late William Whitewright Stuart and of Mrs. Ruthven Stuart, of 35, Sloane Gardens, S.W., and grandson of the late James Stuart and of James Alexander Ruthven, also great-nephew of the late William Whitewright, and Stella Marion Grant-Duff-Ainslie, eldest daughter of Julian Grant-Duff-Ainslie, of the Old Hill House, Hellingly, Sussex, and granddaughter of Mr. and Mrs. Ainslie, of Delgaty Castle, Aberdeenshire.

An engagement is announced between Captain Hugh Tomlinson, M.C., R.F.C., son of the late G. W. Tomlinson, J.P., and Mrs. Tomlinson, 65, Iverna Court, Kensington, and Madeleine de Lacy (Madge), eldest daughter of Captain C. A. Wickham, R.A.M.C., and Mrs. Wickham, Willesborough, Ashford, Kent.

Items.

Second Lieutenant A. de B. Brandon, M.C., R.F.C., Special Reserve, who has also been appointed Companion to the D.S.O., was born in New Zealand in 1884. Educated at Wellington College, New Zealand, and Trinity Hall, Cambridge, he was called to the Bar in 1906, and after a short period in England returned to New Zealand, where he had been practising until the war broke out. Soon after the declaration of war he came to England, and eventually he joined the Flying Corps in December, 1915. Mr. Brandon receives the D.S.O. for gallant conduct and for devotion to duty, and not for destroying or assisting to destroy any particular Zeppelin. On the night of March 31st–April 1st, when Zeppelins dropped nearly 200 bombs, causing 109 casualties, he dropped several bombs over one of the raiders at a height of 9,000 ft., and his aeroplane was hit many times by machine-gun bullets. This was the occasion when the L.15 came down off the Thames Estuary, and another raider was hit and dropped part of its equipment in one of the Eastern Counties. Mr. Brandon also had a share in the destruction of the Zeppelin which was brought down on Sunday. Some time ago he dropped several bombs on an enemy seaplane at Dover.

Lieutenant E. M. Gilbert, R.F.C., who was recently awarded the Military Cross, was, at Enfield on Saturday, presented with a sword by munition workers in the Lea Valley.

Second Lieutenant F. Sowrey, R. Fusiliers, attached R.F.C., who has been appointed Companion to the D.S.O., is 23 years old, having been born at Gloucester on August 25th, 1893, and is the second son of Mr. John William Sowrey, of Staines, Deputy-Chief Inspector of Taxes at Somerset House. He was educated at King's College School, Wimbledon, and King's College, London. He was studying for the Indian Civil Service, but on war being declared was granted a commission in the Royal Fusiliers. He saw service in France with his regiment, and was wounded in the Loos attack in September last year. Mr. Sowrey was wounded afterwards at Ypres, and invalided home in November. He joined the Royal Flying Corps last January, took his pilot's certificate in June, and has been night flying since. He had flown during three raids before that on which he recently brought down a Zeppelin in Essex, and was flying with his friend, Lieutenant Robinson, V.C., when the latter brought down the raiding airship at Cuffley a month ago. Lieutenant Sowrey has two brothers, also in the Royal Flying Corps. The elder, John, is a Flight-Commander, also engaged as a night pilot in aerial defence, and the younger, William, is serving as a pilot with the Expeditionary Force.

The will of Mr. Cyrus Cincinato Cuneo, artist, aged 37, who died on July 21st, of Uxbridge Road, W., who did considerable work in the *Illustrated London News* and illustrated Rider Haggard's stories, and whose aviation pictures have attracted considerable attention, has been proved at £13,639.

* * *

A Desert Tragedy.

A propos of some lines written by John Drinkwater in the *Saturday Review* in memory of "Riddles," a nickname by which Second Lieut. Stewart Gordon Ridley was known in the R.F.C., the *Morning Post* gives the following details of this officer's tragic end :—

"He landed in Egypt at the beginning of June of this year, and was soon sent down to an oasis in the Libyan Desert. In the middle of the month he went out singly on a machine as escort to another pilot, who had with him a mechanic, named J. A. Garside. The work they had to do was at a considerable distance, and a camel patrol had been sent out in advance to form a temporary landing place or station, from which they had to operate. They left on Thursday afternoon, June 15th, and after flying an hour and a-half—half-an-hour longer than they should—they failed to find the camel patrol.

"As it was getting dark they came down and encamped for the night. The following morning the weather was not very suitable, and Ridley, having the light machine, suggested that he should try to find the proper track of the camel patrol. It was, however, found that his engine would not work. It had been giving him trouble the previous afternoon.

"The other pilot then decided that it was necessary that he should go back at once to the base (leaving his water and provisions) and find the exact position of the landing ground. He arranged that he should return on the following day (Saturday) and take Ridley and the mechanic (Garside) separately to the landing ground. He got back to the base, and found that, as the aviators had not turned up, the camel patrol had returned to the base. The pilot and the captain of the Camel Corps returned to the landing ground, and on the following morning (Saturday) the pilot began a search for the other two.

"After some time he reached the place where he had left them, but the mechanic (Garside) and Ridley had gone. They left some odds and ends behind them, but no note. The pilot and his companion returned immediately to the base, and when it was ascertained that Ridley and Garside had not come back, search parties, consisting of camel patrols, motor cars and aeroplanes were at once sent out.

"Nothing was discovered until the Sunday afternoon, when, 25 miles away from the spot where the first night had been spent, a second place was found. There the missing ones had landed, but they had again flown on after having patched up the machine. On the Tuesday afternoon the machine and two dead bodies were found by a motor party. During the search the pilot came across the footprints of two men walking. These were overtaken by a hostile camel patrol, and for a time it was thought and hoped that Ridley and Garside had been captured.

"It was, however, found that Stewart G. Ridley shot himself at half-past 10 on the Sunday night. The captain of the Imperial Camel Corps said that from what he discovered he formed the opinion that Ridley had done this in the hope of saving the mechanic, and the commanding officer of the R.F.C. also states : 'There is no doubt in my mind that he did this act of self-sacrifice in the hope of saving the other man.'

"After Ridley died Garside had kept a rough diary, of which the following is a copy :—

"'Friday.—Mr. Gardiner left for Meheriq, and said he would come and pick one of us up. After he went we tried to get the machine going, and succeeded in flying for about 25 minutes. Engine then gave out. We tinkered engine up again, succeeded in flying about 5 miles next day (Saturday), but engine ran short of petrol.

"'Sunday.—After trying to get engine started, but could not manage it owing to weakness, water running short—only half a bottle—Mr. Ridley suggested walking up to the hills. Six p.m. (Sunday) : Found it was further than we thought; got there eventually; very done up. No luck. Walked back; hardly any water, about a spoonful. Mr. Ridley shot himself at 10.30 on Sunday whilst my back was turned. No water all day; don't know how to go on; got one Very light; dozed all day, feeling very weak; wish someone would come; cannot last much longer.

"'Monday.—Thought of water in compass, got half bottle; seems to be some kind of spirit. Can last another day. Fired Lewis gun, about four rounds; shall fire my Very light to-night; last hope without machine comes. Could last days if had water.'

"A party with a chaplain went out on Sunday, June 25th, and buried the two in the desert, and erected a cross with their names on it over the heap of stones covering the bodies.

"On his father's side Ridley came of a well-known Northumbrian family or clan, and the name of his residence, Willimoteswick, takes one back to that old fortified farmhouse in Northumberland, where was born Bishop Ridley, who with Latimer at Oxford 'played the man.' His mother was born in Derry, where her own mother belonged. To this city Lieut. Ridley's maternal grandfather had come some years before from Newton Stewart, in Galloway."

CORRESPONDENCE.

Lady Smith-Dorrien's Hospital Bag Fund.

[1928] May I crave your assistance in an effort to obtain a further large supply of hospital bags by allowing this letter to appear in your columns. The utility of these small bags for the personal possessions of the sick and wounded admitted to hospital has proved so great that the demands of the Director-General of Medical Services, the Director-General of Voluntary Organisations and the Red Cross have, in consequence of heavy casualties, become overwhelming.

Since April 10th, 1915, my Fund, thanks to the generous support which my previous appeals have met with, has been able to despatch 970,000 hospital bags to the various theatres of war, hospitals in England, hospital ships, the French Red Cross and those of our other Allies. Never before has the Fund been unequal to supplying all demands, but now the last reserve has gone, and there is an order from the Front for 40,000 which I cannot meet at present. It is estimated that some 80,000 will be needed for each of the next two months. I should like to emphasise that not only the wounded but also the sick require the bags, which will explain the enormous numbers needed.

They should be made of cretonne or good strong unbleached calico, measuring not less than 10 ins. by 12 ins. when finished, with a double draw-string of tape and a glazed calico label 4 ins. by 2 ins. (for the patient's name) sewn flat in the centre of one side. I have secured a large consignment of cretonne at *6d.* a yard (wholesale), and suitable labels at 4½*d.* per 100, and can supply at those prices on application.

Address :—Lady Smith-Dorrien, 5, Belgrave Place, London, S.W.

All parcels of above will be sent "carriage forward."

It will greatly facilitate packing for the Front if bags may be tied in bundles of 10 and not folded.

As there are considerable expenses in packing material, carriage, postage, &c., I should be very grateful for small donations towards them. Such expenses for the 16 months since the Hospital Bag Fund was started have amounted to £314 2*s.* 11½*d.* Olive Smith-Dorrien.

"THE AEROPLANE OF TO-MORROW."

VARIABLE SURFACE AND STABILITY.

By LOUIS DE BAZILLAC, Engineer (École Supérieure d'Aéronautique de Paris).

Translated by B. BRUCE-WALKER, B.Sc.

(*Concluded from page* 861.)

Lateral Stability.

The lateral oscillations of the aeroplane and its changes of azimuth take place, in horizontal flight, about two perpendicular axes situated in the plane of symmetry. These are the axis of rolling and the axis of gyration.

Suppose a small disturbance to make the plane of symmetry of the machine turn through an angle $\delta\phi$ about its axis of rolling. If the speed keeps a constant direction the resistance R will not vary, and will remain with the speed in the plane of symmetry. But, from the time when the rotation $\delta\phi$ was effected, the pressure, which before the rotation annulled the weight W of the machine, now gives with this a resultant ρ which is not zero (Fig. 4).

Under the action of this resultant the machine begins to take up an acceleration directed according to ρ, which will make the velocity depart from the plane of symmetry. R will also depart from this plane, and its moment about the axis of rolling will no longer be nil; it will, therefore, make the machine turn about its axis. If this rotation decreases $\delta\phi$ the machine will be stable; if it increases it, it will be unstable.

The stability against gyration can be measured by the moment of the couple which tends to bring the plane of symmetry back to the direction of the relative wind immediately this has changed.

It is easy to see that the couple of stability against rolling is just as much a couple of stability against gyration. The two problems of stability against rolling and stability against gyration are then intimately connected in the problem of lateral stability.

This granted, let us consider an invariable aeroplane undergoing a deviation of rolling or of gyration, and suppose that, whatever its form, it cannot return after this displacement to its usual orientation. We should say that such a machine cannot realise lateral stability. Experience shows us that it is not so generally.

In the case, however, in which the above hypothesis is borne out, does there not exist some means of rendering the machine automatically stable?

We shall see that the automatically variable surface advocated above for longitudinal stability fulfils here again all the conditions necessary for practically assuring lateral stability, if the arrangement adopted for obtaining this variation is sensitive to rolling or to gyration.

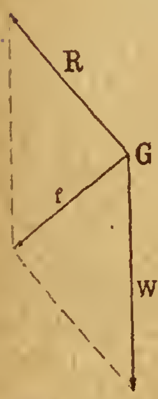


Fig. 4.

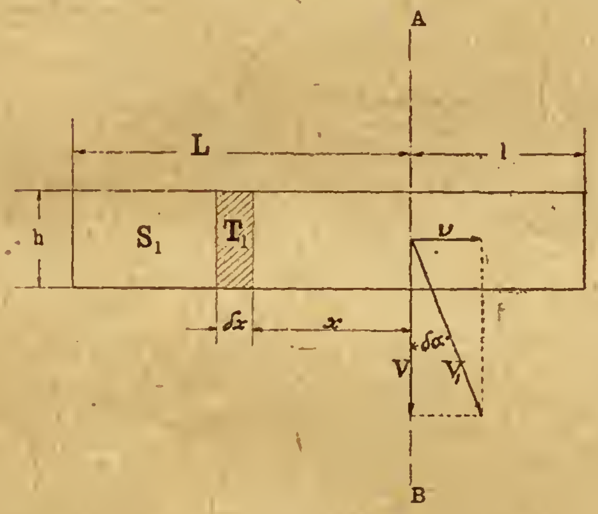


Fig. 5.

One can, in fact, determine a couple of lateral stability with variable surface just as we have determined the couple of longitudinal stability, if by this is understood the stabilising couple obtained by means of enlarging one of the wings, the other, that which receives the gust of wind, remaining unaltered.

The transverse stabilising couple due to the enlargement of the wing that does not receive the gust is counterbalanced by the damping couple due to the span.

Let us calculate the damping couple. The part of the planes that goes down, that which does not receive the gust, s_1 for example (Fig. 5), may be split up into strips T situated at a distance x from the axis of symmetry AB. If ω is the angular velocity of the wing, and assuming that the distance from AB of the axis of rotation may be neglected, one of the strips T_1 takes under the action of the original disturbance a velocity of rotation $v = x\,\omega$. But this strip has besides a velocity of translation V at the incidence α. The velocities, V and v, combine to give a resultant V_1 at the incidence $\alpha + \delta\alpha$. The symmetrically opposite strip, T_2, will meet the air with a velocity, V_2, at the incidence $\alpha - \delta\alpha$.

Let h be the chord of the wing (Fig. 5). The lifting forces of the strips considered were equal to one another, and equal to $K_{y\alpha}\, h\, \delta x\, V^2$ before the disturbance. After the disturbance these forces have become—

$$K_{y\alpha+\delta\alpha}\, h\, \delta x\, V_1^2 \text{ and } K_{y\alpha-\delta\alpha}\, h\, \delta x\, V_2^2\text{; that is to say:}$$

$$\left\{\begin{matrix} K_{y\alpha}\, h\, \delta x\, V_1^2 \\ \text{and} \\ \delta\, K_{y\alpha}\, h\, \delta x\, V_1^2 \end{matrix}\right. \quad \text{and} \quad \left\{\begin{matrix} K_{y\alpha}\, h\, \delta x\, V_2^2 \\ \text{and} \\ -\,\delta\cdot K_{y\alpha}\, h\, \delta x\, V_2^2 \end{matrix}\right.$$

The two first elements of each of these forces are very sensibly equal to one another and equal to the original lifting forces.

The second elements are also sensibly equal, and constitute a couple of leverage x the moment of which may be written:

$$\delta\, C\alpha = \delta\, K_{y\alpha}\, x\, h\, \delta x\, (v^2 + V^2).$$

The variations of $K_{y\alpha}$ for small angles of attack are practically proportional to the variations of the incidence, or to $\delta\alpha$ say. But we have, when $\delta\alpha$ is very small:

$$\delta\alpha = \frac{v}{V}.$$

We can therefore put:

$$\delta\, K_{y\alpha} = \frac{v}{V} \times \text{Constant.}$$

We have then:

$$\delta\, C\alpha = \frac{Cv}{V}\, x\, h\, \delta x\, (v^2 + V^2),$$

and, since $v = x\,\omega$:

$$\delta\, C\alpha = \frac{Cx^2}{V}\,\omega\, h\, \delta x\, (x^2\omega^2 + V^2)$$

$$= \frac{C\,h\,\omega}{V}\,(V^2x^2 + \omega^2x^4)\,\delta x.$$

Integrating between O and l and between O and L (l being the length of the wing not enlarged and L that of the enlarged), and regarding ω as a constant, we have:

$$C\alpha = \frac{Ch\,\omega}{V}\left[\int_0^l (V^2x^2 + \omega^2x^4)\,\delta x + \int_0^L (V^2x^2 + \omega^2x^4)\,\delta x\right],$$

$$C\alpha = \frac{Ch\,\omega}{V}\left[\left|\frac{V^2x^3}{3} + \frac{\omega^2x^5}{5}\right|_0^l + \left|\frac{V^2x^3}{3} + \frac{\omega^2x^5}{5}\right|_0^L\right]$$

$$C\alpha = \frac{Ch\,\omega}{V}\left[\frac{V^2}{3}(L^3 + l^3) + \frac{\omega^2}{5}(L^5 + l^5)\right]$$

Neglecting the term $\omega^2(L^5 + l^5)$ beside the term $V^2(L^3 + l^3)$ we have in the end:

$$C\alpha = \frac{Ch\,\omega\,V}{3}(L^3 + l^3);$$

and taking account of the total weight w of the wings, we have at the end of the time t:

$$C\alpha = \frac{Ch\,\omega\,V}{3}(L^3 + l^3) - \frac{w}{4}(L + l)\cos\frac{360\,\omega\,t}{\pi\,(L + l)}$$

Thus, when a disturbance is produced, the damping couple to which it gives place is, taking into account the growth of one of the wings, proportional to the sum of the cubes of the two lengths of the wings. This couple then is made greater by the lengthening of the wing.

This couple is counterbalanced by the transverse stabilising couple of the enlargement of the wing, which does not receive the gust of wind. This latter couple has for its value:

$$\Gamma = K_{y\alpha}\, h\, V^2\frac{(L^2 - l^2)}{2} - \frac{w}{4}(L + l)\cos\frac{360\,\omega\,t}{\pi\,(L + l)}$$

To measure the action of the transverse stabilising couple equate this couple to the damping couple and write:

$$K_{y\alpha}\, h\, V^2\frac{(L^2 - l^2)}{2} - \frac{w\,(L + l)}{4}\cos\frac{360\,\omega\,t}{\pi\,(L + l)} = \frac{Ch\,\omega\,V}{3}(L^3 + l^3) - \frac{w}{4}(L + l)\cos\frac{360\,\omega\,t}{(L + l}$$

whence: $$K_{y\alpha}\, V\frac{(L^2 - l^2)}{2} = \frac{C}{3}(L^3 + l^3)\,\omega.$$

Let $L = 2l$, $l = 3$, $V = 25$, $K_{y\alpha} = 0{\cdot}02$, and $C = 1/5$. We find:

$$\omega = \frac{1}{2{\cdot}5}.$$

These few considerations are without doubt simple enough since they depend on the principle of splitting up the resistance of the air into elementary resistances. They take account, nevertheless, of the size of the phenomena with an approximation sufficient for the needs of the problem.

The preceding calculation shows that the action of the couple Γ of lateral stability, obtained by means of the automatic enlargement of one of the wings, will generally be sufficient to guard against upsetting. Such an arrangement consequently answers to all the requirements of almost perfectly assured stability.

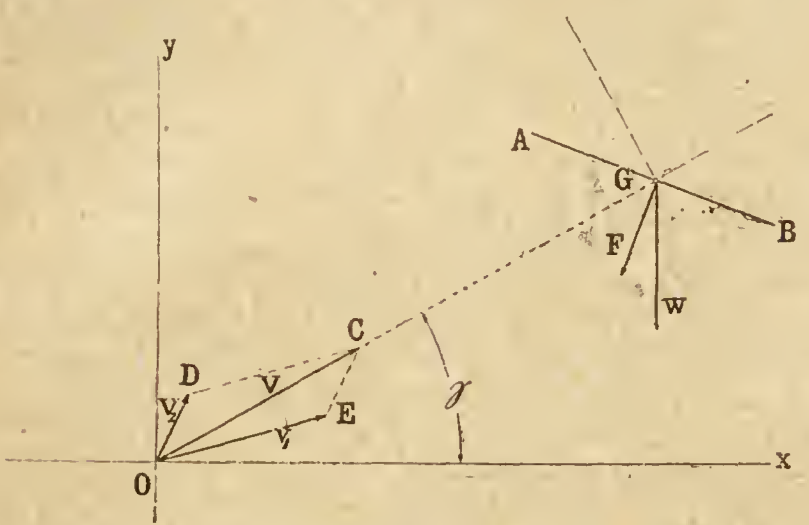


Fig. 6.

Effect on Flying and Hovering with the Engine off.

Variable surface also permits the realisation of flying and remaining stationary in the air with the engine shut off by utilising the ascending currents of air.

Let AB represent the engineless aeroplane, which we will suppose placed facing the wind, of direction OE and velocity V_1 (Fig. 6).

When uniform conditions have been established the aeroplane will follow a trajectory GF, and the wind created by this displacement will be in the direction OD opposite to GF and of velocity $V_2 = GF$. The resultant OC of the two velocities V_1 and V_2 will give in magnitude V and in direction OC the relative wind to which the aeroplane is subjected. All will take place, consequently, as though the aeroplane was descending in *vol plané* following the trajectory OG with velocity V, since in the case of the *vol plané* the relative wind would be equal to V and in the direction OG.

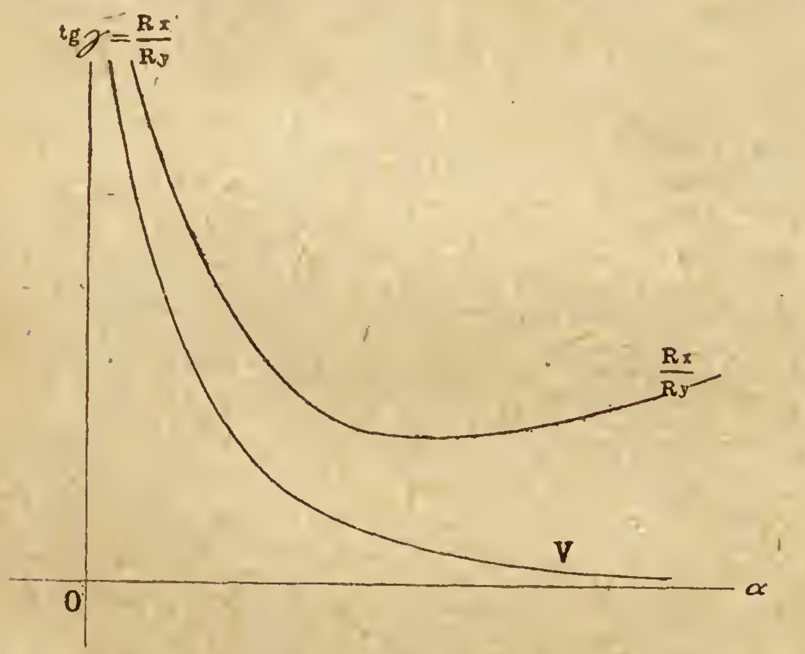


Fig. 7.

Let us construct for an aeroplane of given surface and for a given altitude the curve of the values of Rx/Ry as a function of α (Fig. 7).

It will be easy then to represent in polar co-ordinates the functions:

$$V = F_1(\gamma);$$
$$\text{and} \quad \alpha = F_2(\gamma);$$

for each type of aeroplane and for a given altitude.

In Fig. 8 is shown the general trend of the complete curves. An example will suffice to show the way in which the diagram is used.

Suppose that the wind has a direction OE and a velocity V_1, represented by this length. Let us give the aeroplane an angle of attack $OM = \alpha_2$. The imaginary trajectory will be OM, of slope γ, the relative wind $V\alpha_2 = OC_2$, and the speed of the aeroplane relative to the ground $V'_2 = C_2E$. In this case the aeroplane will ascend while going backwards. With an angle $\alpha_1 = ON$ the relative velocity would be: $V\alpha_1 = OC_1$, the speed of the aeroplane $V''_2 = C_1E$, and the aeroplane would ascend while going forwards.

For $V'_2 = V''_2 = O$, that is to say, for $V_1 = V\alpha_2$ or $V_1 = V\alpha_1$ the point E is on the curve $V = F_1(\gamma)$, and the aeroplane hovers stationary in space.

For $\gamma < \gamma_0$ the hovering becomes impossible. It is apparent from this example that with an aeroplane with fixed surface, for the same angle of attack and with a wind velocity given in direction and magnitude, it is only possible to effect a single operation, ascending and advancing for example.

This is no longer the case if the surface of the machine is variable. The speed $V = F_1(\gamma)$ is represented then by curves such as 1 and 2 (Fig. 9), where S increases from 1 to 2:

The diagram (Fig. 9) shows that the speed of least propulsion OC decreases at the same time as the angle γ.

We know in fact that:

$$\tan\gamma = \frac{Rx}{Ry} = \frac{Kx + \frac{\lambda}{S}}{Ky}$$

will get smaller as the surface is made more considerable in area.

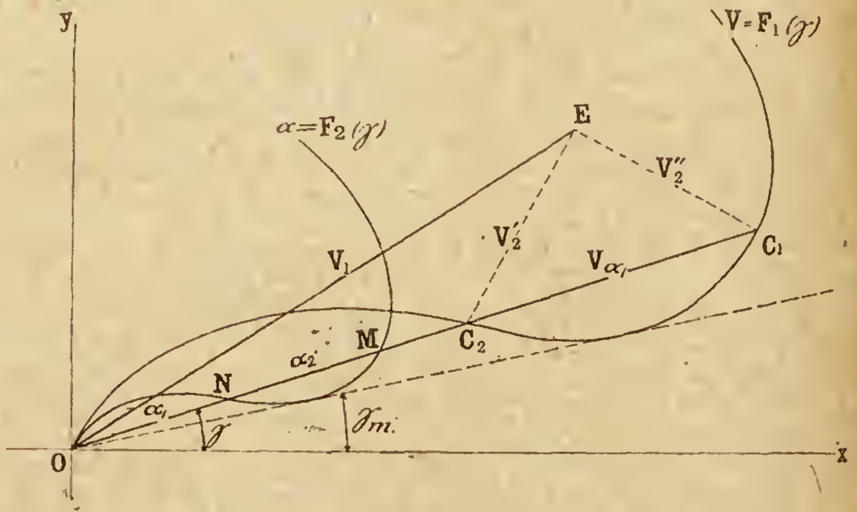


Fig. 8.

Thus, S increases from 1 to 2, γ decreases. Now the speed corresponding to the minimum of γ is:

$$V_0 = \sqrt{\frac{W}{K\Sigma\alpha_0}} = \sqrt{\frac{W}{KS}}\sqrt[4]{\frac{r}{\sigma + r\alpha_1^2}},$$

$$V_0 = \sqrt{W}.\sqrt[4]{\frac{r}{KS(\lambda + r\alpha_1^2 KS)}}.$$

This speed decreases when S increases. It decreases therefore at the same time as γ.

The diagram (Fig. 9) shows again that, for a particular angle γ, when the surface increases the speed $V = F_1(\gamma)$ decreases more rapidly according as the normal speed was made greater.

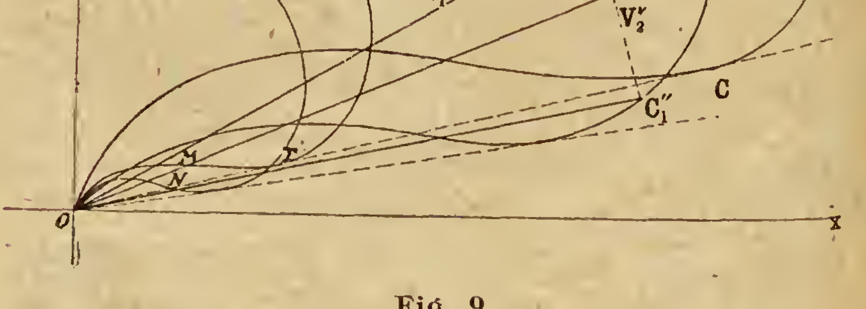


Fig. 9.

The variations of V as a function of S and of γ are in fact given by the relations:

$$\tan\gamma = \frac{Rx}{Ry};$$
$$W = V\mu^2\sqrt{Rx^2 + Ry^2};$$

where μ is a coefficient that determines the altitude Z and is such that $Z = \cdot 18400 \log 1/\mu$.

We obtain from this:

$$\mu R x V^2 = W \sin\gamma$$

$$V^2 = \frac{W}{\mu K x S} \sin\gamma,$$

and, on differentiating:

$$2 V \delta V = - \frac{W}{\mu K x S} \sin\gamma \frac{\delta S}{S};$$

$$\delta V = - \frac{1}{2} V \frac{\delta S}{S}.$$

The same results apply to the curves $\alpha = F_2(\gamma)$, represented by 3 and 4 (Fig. 9), where S increases from 3 to 4.

We have, in fact:

$$\alpha_0^2 = \frac{\sigma}{r} + \alpha_1'^2$$

$$\alpha_0^2 = \sqrt{\frac{\lambda}{r KS} + \alpha_1^2} = OT^2.$$

α_0 decreases when S increases. The best angle for the aeroplane decreases then at the same time as γ.

We have besides:

$$\alpha = \frac{W}{\mu KSV^2} \cos\gamma$$

$$\delta\alpha = - \frac{W}{\mu KSV^2} \cos\gamma \frac{\delta S}{S} = - \alpha \frac{\delta S}{S}.$$

Thus, for a particular angle γ, when the surface increases, the angle of attack $\alpha = F_2(\gamma)$ decreases more rapidly according as the normal angle of attack was made greater.

This granted, suppose that the wind has a direction OE and a velocity V_1 represented by this length. Give the aeroplane an angle of attack $OM = \alpha_1$. The imaginary trajectory will be OM, of slope γ, the relative speed $V = OC'$, and the speed of the aeroplane with regard to the ground $V_2 = C'_1 E$. In this case the aeroplane will descend while going forwards.

But, as the surface of the machine is variable, we can, with a wind of the same velocity and the same direction, and at the same angle of attack, effect several successive operations.

For example, if the surface is increased from 1 to 2, the angle $\alpha_1 = OM$ (curve 3) comes on to ON (curve 4); OC'_1 becomes OC''_1; C'_1E becomes C''_1E; V'_2 becomes V''_2, and the aeroplane ascends while going forwards.

Therefore, at the same angle of attack and with a wind given in magnitude and direction the aeroplane can effect with a suitable surface any desired operation, ascending or descending while going forwards or backwards, ascending or descending vertically, going forwards or backwards horizontally, or remaining stationary in the air.

From this we arrive at the following important conclusions:—

(1) The flying machine can take any minimum gliding angle.

(2) Hovering in the air is, therefore, assured for any ascending wind whatever its inclination may be.

(3) For each value of the inclination of the ascending wind there exist two speeds, at which hovering is possible. These two speeds correspond to two particular angles of attack.

(4) The flying machine can carry out any desired operation of flight or ascent. The wind must obviously be ascending; but it is not necessary for this condition to be fulfilled in an uninterrupted manner; it will suffice, in fact, for this ascendency of the wind to be periodical for the flying machine to be sustained, since it can increase its lifting surface or decrease it at will.

We may, therefore, hope that very shortly men will know how to utilise the wind in order to economise the precious fuel that they have on board.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *Admiralty, October 3rd.*

"A further attack was carried out on the morning of October 2nd by naval aeroplanes upon the enemy airship sheds in the vicinity of Brussels. One of our machines failed to return."

War Office, October 3rd.

"*Salonica.*—The Royal Flying Corps carried out successful bombing attacks on troops and transports in Prosenik and on a railway train travelling from that place to Seres."

General Headquarters (France), October 3rd, 10.25 p.m.

"The weather has interfered with the work of our aircraft. Yesterday one of our machines was missing."

General Headquarters, October 4th.

"Our aircraft have shown in the highest degree the spirit of the offensive. They have patrolled regularly far behind the enemy's lines, and have fought many battles in the air with hostile machines, and many with enemy troops on the ground.

"For every enemy machine that succeeds in crossing our front it is safe to say that 200 British machines cross the enemy's front. A captured corps report described our aeroplanes as 'surprisingly bold,' and their work has been as conspicuous for its skill and judgment as for its daring."

War Office, October 6th.

"*Egypt.*—On the same day our aeroplanes carried out a successful bombing attack on enemy camps in the neighbourhood of El Arish. It appears that our recent aerial attacks on the enemy aerodrome at El Arish have had the effect of compelling the enemy to move their machines and hangars from that place."

"*Mesopotamia.*—On October 1st bombs were dropped by our aeroplanes on the hostile camp at Kut-el-Amara."

Admiralty, October 7th.

"From September 13th to 22nd a series of attacks was carried out by naval aeroplanes operating against the Bulgarian coast.

"On the 13th the Headquarters of the Bulgarian 10th Division at Bademli Chiftlik were attacked with considerable effect. Subsequently these Headquarters were removed elsewhere, but were discovered and attacked three days later, with excellent results. A large explosion was caused, and a fire, which lasted for a considerable time, broke out among the buildings.

"On the 16th considerable damage was caused to transport proceeding on the road towards Drama, and on the same day the shipping in Foujes Harbour was bombed.

"On the 17th and 18th the rolling-stock, gun emplacements and stores at Drama Station were bombarded and considerable damage done to them.

"On the 19th a column of troops and transport were thoroughly plied with small bombs, which caused considerable damage and confusion.

"On the 21st points of military importance on the Seres–Drama road were attacked."

General Headquarters, October 7th.

"The work of the infantry was, as usual, greatly assisted by our aircraft. In spite of bad weather during the past five days, our aeroplanes have done valuable work and dropped a large number of bombs on the enemy."

General Headquarters, October 8th.

"Yesterday, in spite of difficult weather, our aeroplanes did useful work. One of our machines is missing."

War Office, October 8th.

"*Salonica.*—Doiran Front. One enemy aeroplane was forced down behind their lines by our airmen."

French. *Paris, October 3rd.*

"Yesterday our pilots brought down a German machine, which fell near Condé le Sutry (region of Vouziers). Sergt. Sauvage yesterday brought down his fifth German machine in a brisk fight. The enemy aeroplane crashed to the ground south of Transloy."

Paris, October 4th.

"The bad weather interfered with flying operations on the greater portion of the Front."

Paris, October 5th.

"Despite very bad weather, one of our aeroplanes bombarded the aviation ground at Colmar during a night flight.

"Ninety bombs were dropped on the searchlights and military buildings of the port of Zeebrugge."

Paris, October 6th.

"In spite of unfavourable atmospheric conditions, our machines carried out 29 flights in pursuit of enemy aeroplanes and in reconnoitring and observing for artillery purposes.

"A German aeroplane has been brought down."

Paris, October 7th.

"An enemy squadron dropped 25 bombs on Belfort. Nobody was hurt, and the material damage done was insignificant.

" Yesterday our aircraft carried out a number of flights for purposes of artillery observation and reconnaissance.

" Four fights were fought, in the course of which, in addition to the German machine which was brought down south of Peronne, and which was reported in last night's *communiqué*, an Albatros fell headlong in its own lines south of the Bois de Haudronviller.

" Thirty-four 120 mm. shells were dropped on the new German railway station at Vignieulles."

Paris, October 8th.

" Our aeroplanes have regulated the fire of our guns and located many batteries in action in the Somme area. They fought six air fights, and have bombarded Moislains and the Vaux Wood (north of Peronne)."

Russian. *Petrograd, October 5th.*

" *The Baltic.*—On October 3rd, when a raid of enemy seaplanes took place, one of them landed and was captured by us near the island of Runö, in the Gulf of Riga."

Petrograd, October 7th.

" In the region of the Zlota Lipa six aerial engagements were fought, in the course of which Sub-Lieut. Orloff and Lieut. Yanchenko chased an enemy aeroplane and fired incendiary bullets at it with success, the enemy aeroplane coming down enveloped in black smoke."

Italian. *Rome, October 8th.*

" A few enemy aeroplanes, which were driven away by our artillery, dropped bombs near Asiago Gallio and Fonzaso, but without doing any damage."

Rome, October 9th.

" Hostile aeroplanes dropped bombs on Grigne (Sugana Valley), on the Upper Fella Valley, on the Brado Lagoon, on Monfalcone, Cervignano and Torre Zuino, doing a slight amount of damage to buildings."

Roumanian. *Bucharest, October 8th.*

" A squadron of eight German aeroplanes flew over Bucharest at 11 o'clock and dropped bombs in the neighbourhood of the Gare du Nord and on some linen warehouses. The damage was insignificant. The enemy aviators left half-an-hour later."

German. *Berlin, October 4th.*

" On the afternoon of October 2nd naval aeroplanes from the aerodrome at Zeebrugge pursued an enemy air squadron. In the course of a fight which developed an enemy aeroplane was shot down. Our machines returned safely."

Berlin, October 5th.

" Our airmen, who had already on the preceding days by successful attacks caused damage to stores, troop camps and railway premises, yesterday dropped numerous bombs, setting fire to the railway station of Rozhishche and buildings on the communication lines in the vicinity."

Berlin, October 6th.

" An airship and some airmen attacked with bombs the railway establishments and troop encampments north of the Danube."

Berlin, October 7th.

" Five enemy aeroplanes were shot down in air fights or by anti-aircraft guns. Capt. Boelke placed his thirtieth opponent *hors de combat.*"

Berlin, October 9th.

" The greatest efforts are called for from our airmen on observation duty for our artillery and the airmen covering them. The difficult tasks of the airmen on observation duty can only be carried out if the protecting airmen keep off the enemy airmen.

" An unprecedented number of air fights have taken place and ended successfully for us.

" In September we lost 20 aeroplanes in air fights, and one machine is missing.

" The British and French losses are 97 in air fights, 25 shot down from the ground and seven forced to land in our lines —total 129. About half the enemy's losses were in his own lines and the other half in ours."

Austrian. *Vienna, October 5th.*

" On Wednesday a squadron of our seaplanes dropped bombs with very good results on the enemy seaplane station near Grado and on military objectives at Monfalcone, Sancanziano and Staranzano. In spite of heavy firing, all our seaplanes returned safely."

Turkish. *Constantinople, October 3rd.*

" *Egyptian Front.*—Three enemy aeroplanes which, on October 2nd, flew over El Arish and attempted to drop bombs, were forced by our fire to beat a retreat. One machine was damaged."

Constantinople, October 5th.

" On September 24th one of our airmen shot down a British machine on the Felahieh front (on the Tigris)."

BRITISH AIR WORK—A FRENCH TRIBUTE.

The following semi-official account of the work of the British flying officers during the Somme battle was issued in France on October 3rd :—

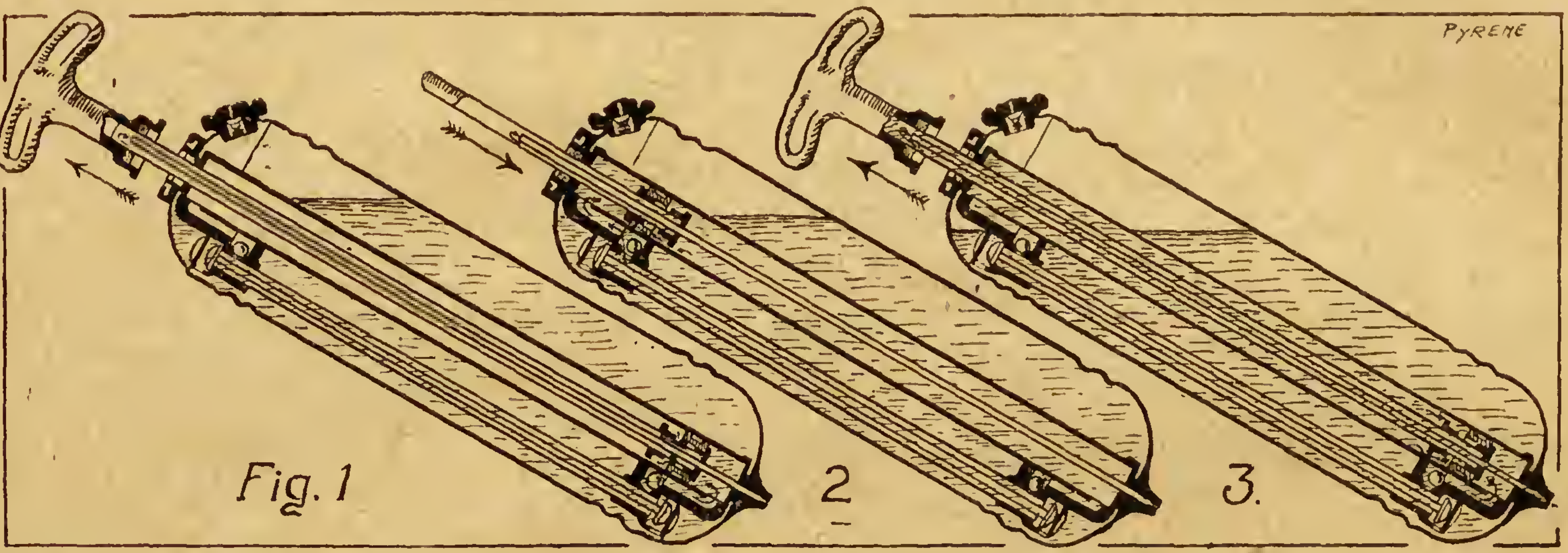
" Our British Allies are not in the habit of mentioning, as we are, the names of the airmen who, like Guynemer, Nungesser and Navarre, add without ceasing new Boche machines to the total of casualties. They exist, however, and they have to their credit some superb records. One pilot, Capt. Albert Ball, 20 years of age, has brought down 29 German aeroplanes and one Drachen. Like Nungesser, he destroyed three machines in a single morning. Without, however, stopping to consider the individual valour, let us look at the figures of the British Army since July 12th. During the month of July 46 German aeroplanes were brought down, 16 were damaged and disabled, one was brought down by anti-aircraft batteries. During August 18 German machines were destroyed, 38 were brought down more or less damaged, and one was brought down by gunfire. September was still more brilliant. Up to the 27th 50 enemy machines were brought down, 60 were hit under very difficult conditions, one was a victim of anti-aircraft fire, and six Drachens were burnt, making a total of 123 machines destroyed and 114 suffering a more or less disastrous fate. All this occurred in the space of 12 weeks' fight. British raiders have not shown themselves less active, for they have dropped thousands of tons of bombs every day on German territory or on land occupied by the Germans.

" The attack on Libercourt on September 25th deserves special mention, for it was conducted with much skill and audacity. The object was to interrupt traffic on the railway from Lille to Douai. Trains were running south carrying reserves or munitions for the battle of the Somme, and it was decided to attack them. Patrols were first of all sent over the aerodromes in order to hold in check the German airmen who had been able to interfere with the British pilots entrusted with the attack. Bombs emitting strong fumes and explosive shells were thrown on the enemy aviation grounds, where great excitement soon prevailed. While this was going on attacking squadrons, with other aeroplanes in attendance crossed the sky, waiting for the opportune moment. The first train was seen to leave Libercourt at 1.40 p.m. The second train was arriving on the line between Henin-Liétard and Ostricourt, where it joins the main line. Capt. C—— and his machine gunner, Sergt. J——, descended to about 250 metres (about 800 ft.) over the first train, near Ostricourt, and successfully dropped six bombs. The engine was hit and jumped the rails. Three coaches were telescoped, and the maddened German soldiers got out of the carriages, looked for a way of escape towards Ostricourt, and in the direction of a wood near by. But Capt. C—— went still lower, fired on the disorganised crowd, leaving numerous dead and wounded on the ground. The second train then arrived, but the first blocked the junction. Lieut. W—— and his gunner carried out a manœuvre similar to that of Capt. C——. Three bombs fell right on to the train. The German troops were panic-stricken and tried to flee across the fields, but, followed by machine-gun fire, they had a difficult task. No fewer than 100 were killed or wounded in the two trains.

" Attacking aeroplanes went to the station at Libercourt, on which they dropped 14 bombs. The buildings were blown up and the railway destroyed. Several overturned wagons obstructed the way in certain parts. Held in check everywhere by advance patrols, German aeroplanes did not appear. At one point one of these patrols destroyed an air shed, while another, operating over Phalempin, caused a large fire, probably in a petrol store. All the British machines returned safely, after having put an enemy aeroplane to flight which had ventured to approach the scene of their exploits."

THE "PYRENE" FIRE EXTINGUISHER.

Fires are not infrequently caused by some trivial outbreak, and many hundreds of pounds worth of damage might have been saved had the source of trouble been quelled at the outset. It is essential, however, that such an outbreak be dealt with promptly and effectively. To accomplish this something better than buckets of sand or water and the so-called portable chemical fire extinguishers (so often relied upon) are required, and for such requirements the extinguisher marketed by the Pyrene Co., Ltd., of 19–21, Great Queen Street, London, has justified its existence on more than one occasion. The Pyrene extinguisher is extremely portable, measuring only 14 ins. in length and 3 ins. diameter, and, what is more important, is very simple and reliable in its operation, being nothing more nor less than a double-acting hand pump contained within its own reservoir of fire-extinguishing liquid. This latter is, perhaps, the principal feature of the Pyrene extinguisher, for it is a *harmless* liquid, consisting of a combination of purely organic materials, and contains neither acid, alkali, salts nor moisture. When directed on to the flames its vapour, being several times heavier than air, clings to the burning object and separates the flames from the atmosphere, thereby extinguishing the fire by smothering it. Petrol, oils, grease, celluloid, tar, acetylene and other inflammable substances are thus easily extinguished with little or no damage to the burning or surrounding objects. Pyrene has the further important advantage of being a non-conductor of electricity, and it can therefore be used with safety and effect in extinguishing electrical fires.



Diagrammatic views of the "Pyrene" fire extinguisher in section, showing the action of the double-acting pump.

The mechanical action of the extinguisher may readily be gathered from the accompanying diagrams. At each end of the central pump tube are ball valves, and these are connected by an outer tube within which is a rod with a feed cap valve at each end. This rod is longer than the distance between its two valves, so that when the weight of the rod causes the uppermost valve to close on its seat the lower valve is open. The central pump tube, together with the valve gear, is free to move around its own axis, so that no matter in what position the extinguisher is held, the feed valves are always under the pump and at least one is submerged, since they revolve by their own weight, and the liquid is always drawn from the lowest part of the container. When the piston-rod, with its sliding piston-valve, is pulled out on the first stroke (Fig. 1), the liquid is drawn through the lower ball valve. On the return or in-stroke the liquid previously drawn in and filling the pump tube is forced through the piston valve into the hollow piston-rod and through the outlet tube within the latter. The lower ball valve has in the meanwhile closed and the upper one opened, admitting liquid to the upper portion of the pump tube (Fig. 2). On the next out-stroke liquid is again drawn into the lower portion of the pump tube and that contained in the upper portion is forced through the piston-valve as before (Fig. 3). With each further stroke a continual flow of liquid is forced through the outlet tube and nozzle. The flow ceases as soon as the operator leaves off pumping, and the remaining liquid is available for further use until exhausted, when the container is recharged with a fresh supply through the filler-cap.

The uses to which an extinguisher such as the "Pyrene" could be put in connection with the aircraft industry are innumerable. Not only can they be carried on aircraft themselves, but they could be conveniently placed to advantage at various parts of an aerodrome—in certain French aerodromes mechanics proceeding to meet an in-coming machine always carry a "Pyrene" extinguisher with them—in hangars, and, of course, in the various shops of an aircraft factory. In conclusion, it may be of interest to note that "Pyrene" extinguishers are supplied, amongst many others, to the following: The War Office, Admiralty, the Allied Governments, the Royal Flying Corps, and most of our aircraft and motor manufacturers.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

Landing practice last week: Messrs. Green and Kaizer. Straights with Instructor: Lieut. Hitchcock. R.H. circuits: Messrs. Lord, Norris and Ranson.

Instructors; Messrs. Manton, Winter, Pashley, Biard and Hale.

Tribute from the Enemy.

In spite of the persistent way in which the German Headquarters *communiqués* lie as to their aircraft losses, the truth will out as to the effective work of the R.F.C. The most striking tribute to hand lately is contained in the memorandum by General Sixt von Arnim, commanding the IVth German Corps, on the experiences of that Corps in the battle of the Somme in July last. He says:—

"The means for providing the artillery with aerial observation has proved insufficient. . . . The numerical superiority of the enemy's airmen and the fact that their machines were better were made disagreeably apparent to us, particularly in their direction of the enemy's artillery fire and in bomb-dropping. . . . The number of our battle-planes was also too small. The enemy's airmen were often able to fire successfully on our troops with machine guns, by descending to a height of a few hundred metres. The German anti-aircraft gun sections could not continue firing at that height without exposing their own troops to serious danger from fragments of shells. This has produced a desire for the anti-aircraft defences to be supplemented by machine guns. A further lesson from this surprisingly bold procedure of the English airmen is that the infantry make too little use of their rifles as a means of driving off aircraft."

He makes a number of recommendations for improving the anti-aircraft establishments, with advice as to the types and number of guns to be used.

SIDE-WINDS.

MESSRS. CHAS. BOSS AND CO. (Liverpool), Ltd., 634, Royal Liver Building, Liverpool, the well-known timber specialists, are receiving at Manchester per "Malvern Grange" a parcel of prime, rift sawn silver spruce, good specification. They have also due to arrive within the next three or four weeks about 200 standards similar stock.

- - -

CLIENTS of Mr. William Moss, the "parts specialist" of 52, High Street, New Oxford Street, W.C., should make a note that his telephone number is Gerrard 6731, while telegrams should be addressed to "Airobilimos-Phone." Quite a brain-wave that.

- - -

THE great success of the fortnightly list of the Aircraft Supplies Co., Ltd., has necessitated a little alteration in the issuing arrangements. In future it will be published monthly, while it will be kept up-to-date by weekly supplements. It is an invaluable little publication, and if there are any firms who have not applied to have it sent to them regularly they should send along their name at once to the Aircraft Supplies Co., Ltd., 17, John Street, Theobald's Road, London, W.C.

- - -

THE steadily increasing demand for their fans and other specialities has necessitated the Buffalo Forge Co. obtaining more commodious offices for their headquarters in London. They are still to remain at Caxton House, Westminster, but in future their location will be on the first floor in the West block of Caxton House.

- - -

MESSRS. BROWN BROTHERS', LTD., new list of aircraft accessories shows that they have laid themselves out to supply practically any material, component, fitting, or accessory which may be required in connection with the building or maintenance of aircraft. Every firm in the industry should make a point of getting a copy, which will be sent by return on application to Messrs. Brown Brothers' head offices, 22–34, Great Eastern Street, London, E.C.

- - -

THE new edition of the C.A.V. Blue Book of Lighting is in abeyance until the end of the war, but the firm have published an abridged catalogue which gives particulars of their lighting sets, lamps, horns, and other electrical fittings. A most ingenious little fitting, of which details are given, enables the bulb to be correctly focussed in the lamp with very little trouble. Those who are considering the question of electric lighting, whether for aeroplane or motor car work, should drop a line to the C.A.V. Co., Acton, London, W., for a copy of their latest booklet.

LEGAL INTELLIGENCE.

The General Aviation Contractors, Ltd.

ON Wednesday, October 4th, a motion was heard before Mr. Justice Atkin as Vacation Judge in an action brought by Mr. D. L. Santoni against the General Aviation Contractors, Ltd., and another.

Mr. Woodgate (instructed by Messrs. Osborn and Osborn) appeared for the plaintiff; and Mr. G. W. H. Jones (instructed by Mr. F. A. Rudall, of 48, Watling Street, E.C.) appeared for the defendants.

From the affidavits which were read, it appeared that, in pursuance of notices duly given, a resolution had been passed on September 7th for the voluntary liquidation of the defendant company and for the appointment of Mr. W. A. Casson as liquidator. These resolutions were to be confirmed at a meeting called for October 6th, and the object of the action was to obtain a declaration that the original resolution was passed improperly, and for an injunction to restrain its confirmation. The affidavit of the plaintiff Santoni set out that he held a controlling share interest in the company, and that the resolution was passed whilst he was absent in Italy on the company's business.

Mr. G. W. H. Jones proceeded to read the affidavit of Mr. W. Ridley Prentice on behalf of the company, in which it was denied that any irregularity had taken place, when the Judge stopped him and stated that he had read sufficient of the affidavit for the purposes of the motion.

Mr. Jones then stated that the object of the liquidation was to obtain an order of the Court for the examination of the plaintiff Santoni, as allegations were made against him as to the manner in which he had dealt with certain assets of the company in the form of shares in the Societa Anonima Costruzione Aeronautiche Savoia and Agenzia Generale Forniture Aeronautiche Companies.

Without calling upon counsel for the plaintiff, the Judge said that he would make no order on the motion. The application for the injunction therefore failed.

COMPANY MATTERS.

General Aviation Contractors, Ltd.

AT a meeting of shareholders of the company on Friday, October 6th, a resolution was confirmed to put the General Aviation Contractors, Ltd., into voluntary liquidation, and to appoint Mr. W. A. Casson liquidator.

It was stated at the meeting that an unsuccessful attempt had been made by Mr. D. L. Santoni to obtain an injunction against the company to prevent the passing of the resolution for liquidation.

We understand that all the creditors, of whom there are very few, will be paid in full, and that the principal object of the liquidation is to follow up proceedings against Mr. Santoni in certain actions which have been begun, and the writs for which have already been served on Mr. Santoni during his recent visit to England in connection with the above abortive legal proceedings.

NEW COMPANY REGISTERED.

AIRCRAFT TRANSPORT AND TRAVEL, LTD., 47, Victoria Street, Westminster.—Capital £50,000, in £1 shares (25,000 5 per cent. participating pref.). Manufacturers of and dealers in aeroplanes, balloons, airships, and flying machines of all kinds, motors, &c. First directors, G. H. Thomas (Managing Director) and A. F. Thomas.

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	Imports.		Exports.		Re-Exportation.	
	1915.	1916.	1915.	1916.	1915.	1916.
	£	£	£	£	£	£
January ...	20,382	1,509	435	6,399	13,706	—
February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	59,287	2,400	—
July ...	1,240	2,072	13,372	12,932	—	—
August ...	664	2,583	36,276	13,555	247	420
September	536	1,076	4,908*	36,048	—	—
	31,318	27,427	102,593	216,559	48,791	4,510

* ? should be £14,908.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

Politicians and Prussianism.

IN a speech delivered at the annual meeting of the Liberal Federation of Ontario last week, Sir Wilfred Laurier uttered a deprecatory warning which we in this country will do well to ponder and take to heart. After contrasting the methods of Germany with those of the British Empire, and expressing his deep conviction that the policy of Britain in the past should be the policy of the future, Sir Wilfred went on to say :—

"Yet while our men are fighting at the front there are amongst us men consuming the midnight oil and spending a lot on printer's ink in reconstituting the British Empire, not upon the old lines of British freedom, but upon the lines of German militarism. It would be a sad day if, when we are engaged in a war the object of which is to save civilisation from militarism, the result was to saddle the victorious nations with militarism."

Sir Wilfred apparently intended his remarks to apply to the question of militarism pure and simple, as it affects defence and aggression, but it would have been possible to have gone a great deal farther in his deprecation of the disquieting tendency which is increasingly observable to incorporate more and more of the spirit of Prussianism into the life and affairs of Britain. Admitting that the organisation of Germany for war and commerce is a wonderful structure, it does not follow that the mere aping of the worst features of its methods is the only, or even the best, solution of the problems we shall have to face after the war.

So far as concerns the future of military service, it is not within the province of this journal to discuss it in detail, even were the times appropriate. But there are larger aspects of the Prussianising tendency which do concern us and every thinking citizen. On every hand we see the malign influence of the professional politician making itself felt in the manifest endeavour to restrict the liberties of the subject and to ensure the permanency of government by a bureaucracy. We use this last expression advisedly, since it cannot have escaped the most casual observer that that is the form of government which directs the affairs of the nation for the present. Nor, provided the politicians were, in sporting parlance, prepared to play the game, should we have any quarrel about it.

Such an emergency as that with which we are faced cannot be dealt with by the ordinary machinery of democratic government—a wise and benevolent autocracy is necessary for the moment. But it must possess those two qualities to approach the ideal, and it is precisely those qualities that are lacking. Instead, we find existing a questionable atmosphere of intrigue and chicanery, and an ample evidence of political wirepulling which gives rise to grave misgivings regarding the conditions that are likely to obtain in the days of "after the war.

Without any manner of doubt, the politicians are insidiously laying their plans for a complete Prussianisation of the country. On every hand the signs are there to be read as we run. Our every movement is subject to control of one sort or another. Every jack-in-office considers that he has full licence to impose his own edicts on the individual, as witness the example of the coroner "somewhere in the Midlands," who, in the conduct of an air-raid inquest, told the foreman of the jury, who had ventured the remark that there was blame somewhere for things not being done, that: "I cannot allow you to express your private opinion!" Ye gods! Things have come to a pretty pass indeed when a petty official talks of "not allowing" a free expression of opinion upon matters of public interest.

But we have only quoted this minor example as an evidence of the general trend of things. By itself it would simply be a rather humorous incident, illustrating the swollen-headedness of an individual. Unfortunately, it goes deeper, in that it is eloquent of the condition into which the country is being led by the bureaucrats. Everywhere we see the signs of Prussianisation, often under the specious guise of a socialistic-cum-war-emergency necessity designed to gull the public into a sense of complaisant security. Everything is to be nationalised, so that we may be certain of winning the war! That appears to be one of the latest shibboleths of the politicians. By all means let the State take over all and every Imperial resource if that be necessary to the winning of the war. We are all of us agreed upon that, and we are all of us willing to suffer the maximum of inconvenience to that end. We are, so we are told—and we do not mean it to be inferred that we do not believe in the sentiment—fighting this war in defence of liberty and all that liberty stands for. If the ultimate result of the struggle is to be for us a bureaucratic despotism worse than anything that Germany has been able to show us, then our sacrifices will have been vain.

We have Royal Commissions and Committees sitting to report on every conceivable thing under the sun, and, generally speaking, their recommendations all trend in the one direction—that of more direct control by the State. Commerce of the future is to be directed by the State. Meat and bacon are to be State monopolies. Shipping is to be under State control. Municipalities are to be compelled to go into shop-keeping—in a word, the whole life of the community is to be socialised. By inference this is to happen *for the period of the war only*. But does any sane person imagine that we are to be allowed to go back to the state of comparative liberty enjoyed before the war? The idea gives us to laugh, as our Allies across the Channel have it. In the first place, you cannot trust in the smallest degree the pledges of the politicians. Whether it is a case of cajoling the votes of the public or of getting a controversial measure through Parliament, pledges wholesale are never wanting—and they have the value of the mere words uttered for the moment and nothing farther. No need to quote examples, or if one were needed, there is the scandal of the excess war profits enactment, in principle a measure of soundness, but as passed, having regard to the pledges, utterly ignored, of Ministers during debate, nothing less to thousands of British subjects than a legalised barefaced act of confiscation and robbery.

In fact, the whole history of government by lawyer partisans is one of broken and forgotten pledges, amounting in many cases to fraudulent and misleading statements of the worst kind.

Therefore, whatever the pledges given that this measure of restriction or that shall only be temporary in its incidence, we have always to keep in mind that we cannot regard these pledges as having one iota of honourable intention in them. Farther than that—and possibly even more serious in its lasting effects—is the fact that every such measure means the creation of yet another small—or big—army of officials to administer it. All these officials draw Government pay for their services, and it is not to be supposed that at the end of the war these people are going to submit without a struggle to the discontinuance of the various Acts of Parliament that have created their jobs. The answer to that may be that public opinion will ensure the removal of objectionable restrictions. Will it? Bear in mind that at the rate we are going on now, the preponderance of public opinion after the war will be official opinion, and we are not going to get that opinion on the side of abolishing anything in the way of official jobs. We are in a fair way of becoming a nation of officials, and unless something can be done in time the post-war position will be as we have said. We are honestly convinced as a result of a study of the signs of the times that there is a deep lying movement in progress to officialise—to put it in the very mildest term possible—the whole life and business of the nation, and unless the progress of that movement is arrested in time, our last case will be worse than the first. As we have so often said in the past, the art of politics is simply putrid. We had hoped that the war would have brought about a change for the better, but by the trend of events it would seem as if things may be worse than ever.

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Bring Them into the Open!

A Bill has passed through the House of Lords, embodying the principle of registration of the names of all persons and firms carrying on trade in this country under names other than their own. Its passing through the Commons has been delayed, and according to Mr. H. J. Glanville, M.P., "It may be hung up indefinitely unless there is pressure by the commercial world." Why? To the honest trader no more useful measure could be imagined.

In support of the Bill it is urged that a very large number of cases has been disclosed of enemy aliens

AN EVENING SCENE AT HENDON.—E. Baumann on a Ruffy-Baumann with a passenger.

trading either in the names of British firms or under the titles of British companies. Even apart from the shelter afforded by the present system in the direction indicated, what is the objection to the proposed measure, and why should it be hung up indefinitely? There seems no reason in the world to be advanced against such a scheme of registration as that in effect in Australia, for example. When it comes to measures directed against the liberties of the mere Briton, Parliament is capable of rushing through an Act, from first reading to Royal assent, in a couple of days—we almost said hours, but procedure steps in there. When, however, the proposed measure is one for the protection of the national interest, interminable delays occur. No wonder there is a profound belief in the "Hidden Hand." There is far too much of this tenderness toward the Hun in official quarters, and the people responsible have only themselves to thank if they are suspect of leanings toward the common enemy.

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Honour for the Dead. We like the suggestion of a correspondent of the *Morning Post*, that a token of recognition of the supreme sacrifice should be given by the nation to the relatives of those who have laid down their lives in the country's cause during the Great War. We are, on general principles, against the multiplication of badges and medals, but in this case we are all for something of the kind being done. The French Government, with ready and sympathetic appreciation, has already promulgated a law which decrees that a "Diploma of Honour," bearing the inscription: "Aux morts de la grande guerre, la patrie reconnaissant," shall be sent to the families of soldiers who have died for their country. We agree with the correspondent of our contemporary in the view that some such token would bring its meed of consolation and of heartening pride to many a stricken home, and would be cherished as an heirloom in the families of those who have given of their best for their country. We sincerely hope that the idea will not be lost sight of, and that measures will be taken at once to give it proper effect.

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The Light of a Match. In a Midland town the other day a number of persons were fined for striking matches in the streets on the night of an air-raid. The offence may appear to be a trivial one on the face of it, but it is really not so. In a previous issue of "Flight" we gave the detailed results of visibility tests with certain kinds of lights, and noted at the time the apparently almost incredible fact that, on a dark night, the light of an ordinary match was easily visible at a distance of a mile. Hostile aircraft do not, as a rule, fly at as low an altitude as a mile, and on the basis of the tests noted above, the striking of a single match would be neither here nor there. According, however, to the evidence of a police superintendent, although the street lamps were all extinguished during the raid, there was almost as much light as though they had been lit, owing to people striking matches to light pipes and cigarettes! As an evidence of the *sang froid* with which the Midlanders regard the coming of the Zepps., the policeman's statement is admirable reading. It reflects very badly, however, on their common-sense. One match, as we have said, may be harmless, while a number may be deadly. Therefore, the moral is that during a raid people whose curiosity brings them out of doors must forego their smokes.

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THE ROLL OF HONOUR.

Reported by the Admiralty:—

Slightly Wounded.

Prob. Flight Sub-Lieut. J. S. Wright, R.N.

Prisoner of War.

Flight Sub-Lieut. B. A. Millard, R.N.

Reported by the War Office:—

Previously reported Missing, now reported Killed.

Lieut. N. A. Browning-Paterson, R.F.A. and R.F.C.
Lieut. J. C. Turner, R.F.C.
Capt. G. W. Webb, R. Irish Rifles and R.F.C.

Died of Wounds.

2nd Lieut. P. R. Pinsent, R.F.C.
5569 Corpl. D. B. Walker, R.F.C.

Previously reported Wounded, now reported Died of Wounds.

Capt. K. A. Brooke-Murray, A.S.C., attd. R.F.C.

Previously reported Wounded and a Prisoner of War, now reported Died of Wounds as a Prisoner of War in German hands.

Lieut. J. R. Dennistoun, Cav. Spec. Res. and R.F.C.

Previously reported Missing, now reported Died of Wounds as Prisoner of War in German hands.

2nd Lieut. R. M. Wilson-Browne, R.F.C.

Died.

2nd Lieut. J. S. Mitchell, R.F.C.
34188 2nd Air-Mech. J. W. Garratt, R.F.C.

Killed.

3192 Corpl. A. Winterbottom, R.F.C.

Wounded.

Lieut. W. F. Anderson, Canadian Gen. List, attd. R.F.C.
2nd Lieut. C. J. Cleaver, R.F.C.
2nd Lieut. D. D. Fowler, R.F.C.
2nd Lieut. S. A. Gibbons, R.F.C.
2nd Lieut. R. St. J. Hartley, Devon, attd. R.F.C.
Lieut. C. C. Miller, Duke of Wellington, and R.F.C.
2nd Lieut. A. Rice-Oxley, Shropshire L.I. and R.F.C.
2376 Corpl. N. D. Bryce, R.F.C.
3436 Corpl. G. Munk, R.F.C.
1270 1st Air-Mech. J. C. Nicholls, R.F.C.
19845 2nd Air-Mech. F. Tilyard, R.F.C.

Missing.

2nd Lieut. W. R. C. Carmichael, Highland L.I., attd. R.F.C.
2nd Lieut. W. C. Fenwick, R.F.C.
2nd Lieut. C. Kennard, R.F.C.
2nd Lieut. W. D. Miller, R.G.A. and R.F.C.
17018 Sergt, H, Bellerby, R.F.C.
6537 1st Air-Mech. L. O. Law, R.F.C.

Previously reported Missing, now reported Wounded and Prisoners of War in German hands.

2nd Lieut. R. T. Griffin, R.F.C.
2nd Lieut. A. J. O'Byrne, King's (L'pool), attd. R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. S. P. Briggs, Northants. and R.F.C.
Capt. E. W. Leggatt, Wiltshire, attd. R.F.C.
2nd Lieut. A. W. Reynell, R.F.C.
2nd Lieut. K. K. Turner, R.F.C.

The British Air Services

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, October 10th.

Temp. Sub-Lieut. S. A. S. Cheshire, promoted to Lieut. (temp.), seniority, May 15th; H. French, R.N.V.R., promoted to Temp. Lieut., R.N.V.R., seniority Oct. 5th.

Proby. Flight Sub-Lieut. (temp.) A. A. Bryce-Buchanan, granted temp. Commission as Sub-Lieut., R.N.V.R., seniority Oct. 9th.

Air Mech., 2nd Grade, N. McCrirrick granted temp. commission as Sub-Lieut., R.N.V.R., seniority Oct. 15th.

C. C. Purdy and C. C. Goodhue entered as Proby. Flight Sub-Lieuts. for temp. service, to date Aug. 23rd and Sept. 13th respectively.

A. E. Kitsell entered as Warrant Officer, 2nd grade, for temp. service, to date Oct. 9th.

Chief Petty Officers (1st Class) J. W. Jean, W. Cole, V. H. Lurie, F. Polley, and M. F. Morris promoted to Warrant Officers, 2nd grade, all to date Oct. 1st.

Chief Petty Officers (2nd Class) E. A. Blundell, J. S. Middleton, F. W. Todd. Chief Petty Officers (3rd Class) B. H. England, W. J. Standish, W. J. Harris, and Petty Officer J. C. Nerney promoted to Warrant Officers, 2nd grade, for temp. service, all seniority Oct. 1st.

Admiralty, October 11th.

C. E. Fox, entered as Proby. Flight Officer, temp., and appointed to the "President," for R.N.A.S., date Oct. 15th.

Admiralty, October 12th.

Lieut.-Com (R.N.) K. G. Brooke appointed Acting Com., date Oct. 9th.

H. D. Grant and F. L. Morrison granted temp. commissions as Sub-Lieut., R.N.V.R., seniority Oct. 11th and Oct. 10th respectively.

L. E. M. Gillman entered as Proby. Flight Officer, temp. service, date Oct. 15th.

Acting Carpr. C. V. Lacey graded as Warrant Officer, 2nd grade, date May 19th, 1915.

Admiralty, October 13th.

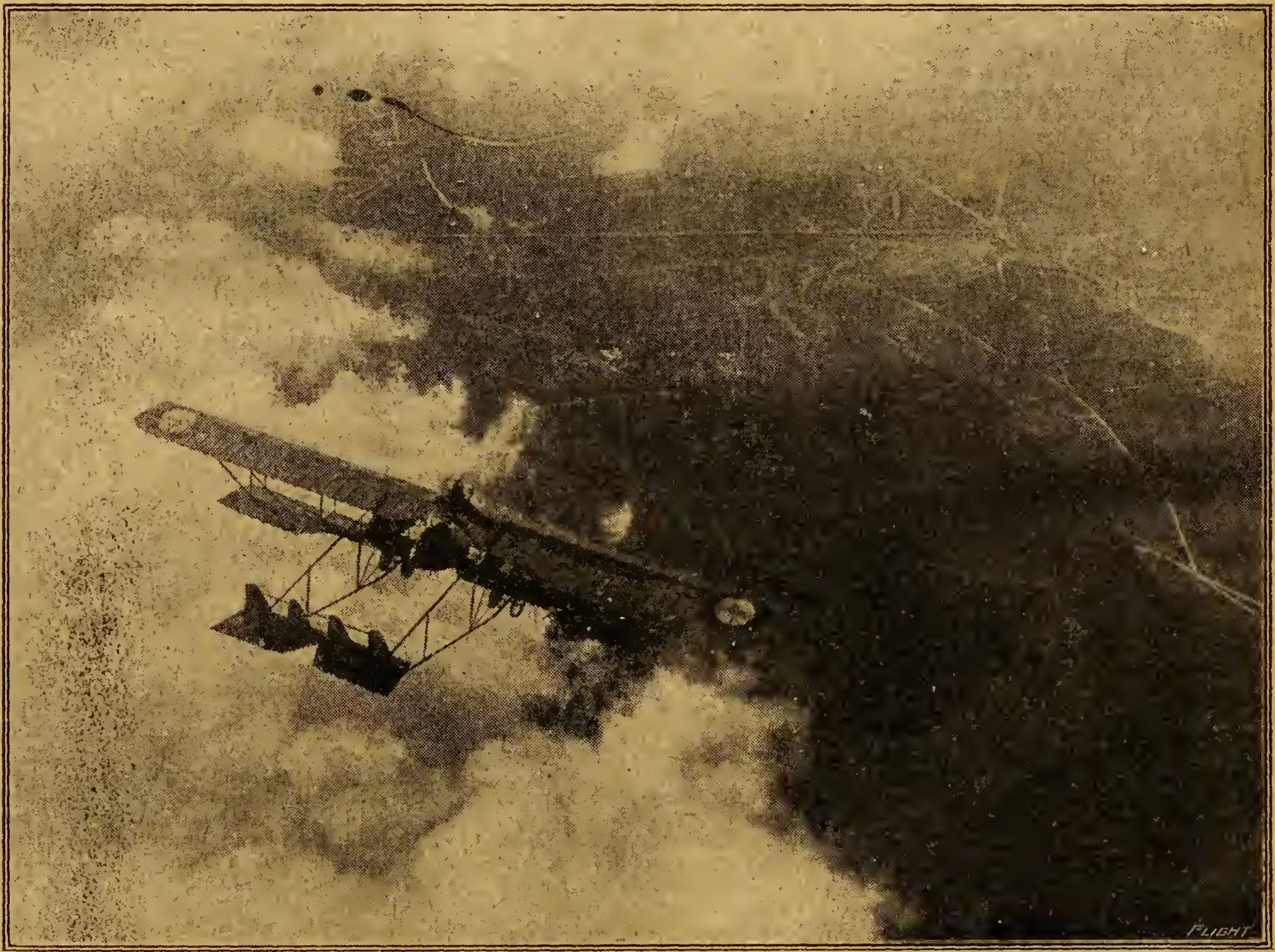
The undermentioned have been entered as Proby. Flight Officers for temp. service, all to date Oct. 15th: H. D. Driver, E. D. B. Russell, E. S. Ades, J. F. V. Sugars, F. T. P. Williams, G. H. Shaw, L. R. Knowles, A. W. Wood, I. E. Smithies, W. B. E. Powell, M. J. R. Duff-Fyfe, and C. R. L. Outhwaite.

Admiralty, October 14th.

R. M. Smylie granted a temp. commission as Lieut., R.N.V.R. J. J. W. Nicholson granted a temp. commission as Sub-Lieut., R.N.V.R., and both appointed to the "President II," additional, for R.N.A.S., to date Oct. 13th.

Admiralty, October 16th.

H. L. Crowe entered at Proby. Flight Sub-Lieut. for temp. service, to date Sept. 28th. Chief Petty Officer W. Liniker promoted to Temp. Warrant Officer, 2nd grade, to date Oct. 1st.



A French aeroplane on a bombing expedition "out yonder." A snap from another aeroplane while in flight above the clouds.

Royal Flying Corps (Military Wing).

London Gazette, October 10th.

Flying Officers.—Temp. 2nd Lieut. C. J. Truran, Gen. List; June 28th. Sept. 15th: Temp. Lieut. J. E. H. Dakin, Motor Machine Gun Corps, and to be transferred to Gen. List.; Temp. 2nd Lieut. T. Langwill, High. L.I., and to be transferred to Gen. List; 2nd Lieut. (on prob.) H. J. Gearing, High. L.I., Spec. Res., and to be seconded; 2nd Lieut. (on prob.) A. N. David, Spec. Res.; Temp. 2nd Lieut. (on prob.) J. V. Lyle, Gen. List. Sept. 16th: Temp. Lieut. W. F. W. Hills, R.A., and to be transferred to Gen. List; 2nd Lieut. N. Middlebrook, Rifle Brigade, Spec. Res., and to be seconded; 2nd Lieut. N. H. Read, Spec. Res.; Temp. 2nd Lieut. T. E. Duffy, Lan. Fus.; Temp. 2nd Lieut. O. F. G. Ball, R. Sussex R., and to be transferred to Gen. List; 2nd Lieut. E. E. Glorney, Spec. Res.; 2nd Lieut. G. L. Rodwell, Spec. Res. Sept. 18th: 2nd Lieut. (Temp. Capt.) I. A. J. Duff, Dorset R. (T.F.); Temp. Lieut. C. Fairbairn, Gen. List, from a Flying Officer (Ob.), with seniority from May 30th; Temp. 2nd Lieut. (on prob.) J. E. B. Thornely, Suff. R., and to be transferred to Gen. List. Sept. 19th: Lieut. (Temp. Capt.) D. M. Stewart, R. Scots (T.F.); 2nd Lieut. J. F. Lawson, S. Mid. (Warwick) R.G.A. (T.F.); 2nd Lieut. (on prob.) P. B. Pattisson, Spec. Res.; 2nd Lieut. (on prob.) J. B. Ackroyd, Spec. Res. Sept. 20th: 2nd Lieut. (Temp. Lieut.) C. Butler, W. Rid. R.E. (T.F.); Temp. 2nd Lieut. J. W. Baker, E. Surr. R., and to be transferred to Gen. List; 2nd Lieut. E. G. E. Donaldson, R.F.A., Spec. Res.; 2nd Lieut. (on prob.) W. G. Helpman, 2nd Regt., King Edward's Horse, and to be seconded.

Balloon Officers.—Sept. 23rd: Lieut. F. Wilkinson, S. Staff. R. (T.F.); 2nd Lieut. (on prob.) C. H. Knight, Dorset R., Spec. Res., and to be seconded.

Memoranda.—The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Pte. F. W. Poat, from A.S.C.; Sept. 10th. Pte. W. C. Faull, from R.A.M.C.; Sept. 16th. 1st Class Air Mech. H. W. Armstrong, from R.N.A.S.; Sept. 25th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) resign their commissions. Oct. 11th: C. H. Biddlecombe, S. L. Hollis. 2nd Lieut. (on prob.) W. E. M. Walker is confirmed in his rank. L. B. W. Jolley to be 2nd Lieut.; Sept. 14th. The undermentioned to be 2nd Lieuts. (on prob.) J. F. C. Bell, Sept. 17th; C. A. Brown. Sept. 25th; C. W. Olliver, Sept. 28th; E. I. David, Oct. 1st.

London Gazette Supplement, October 11th.

Commandants of Schools of Instruction, Staff Officers, 1st Class (graded for pay as A.A.G.'s).—Sept. 28th: Major C. Saunders, D.S.O., Dorset, R., and to be Temp. Lieut.-Col. whilst so employed; Major I. M. Bonham-Carter, Northd. Fus., and to be Temp. Lieut.-Col. whilst so employed.

Park Commander.—Temp. Lieut. (Temp. Capt.) A. Cleghorn, 1st Highland Fd. Coy., R.E. (T.F.), from an Equipment Officer, and to be Temp. Major whilst so employed; 20th Sept.

Squadron Commander.—Capt. C. T. Maclean, R. Sc. Fus., from a Flight Commander, and to be Temp. Major whilst so employed; Sept. 1st.

Flight Commanders.—From Flying Officers: Capt. J. E. Dixon-Spain, Hamps. R.; Aug. 23rd. Lieut. E. R. Pretyman, Som. L.I., and to be Temp. Capt. whilst so employed; Sept. 27th.

Equipment Officer.—1st Class, and to be Temp. Capt. whilst so employed: Temp. 2nd Lieut. N. F. D. Buckeridge, Gen. List, from a Flying Officer; Sept. 8th.

Flying Officers.—Temp. 2nd Lieut. F. Crisp, Gen. List; Sept. 18th. 2nd Lieut (Temp. Lieut.) G. S. Buck, Lond. R. (T.F.); Sept. 21st. Sept. 22nd: Temp. Capt. J. W. W. Nason, R. Suss. R., and to be transferred to Gen. List; Temp. 2nd Lieut. A. H. Gearing, R. Fus., and to be transferred to Gen. List.

Flying Officers (Observers).—2nd Lieut. A. V. McKiever, Sea. Highrs. and to be secd.; Feb. 13th. 2nd Lieut. (Temp. Lieut.) L. Walmsley, E. York R., Spec. Res.; Feb. 14th. 2nd Lieut. G. St. V. Pawson, Westmoreland and Cumberland Yeo. (T.F.); Feb. 15th. Temp. Lieut. S. H. Hewitt. Gen. List; July 14th. Lieut. F. S. Rankin. Canadian Engrs.; Sept. 18th. Sept. 22nd: Capt. A. L. Taylor, 28th Canadian Inf. Bn. Temp. 2nd Lieut. E. V. D. Mathews, D. of Corn. L.I.. and to be transferred to Gen. List; Temp. 2nd Lieut. W. G. Barker, Gen. List. Sept. 23rd: Temp. 2nd Lieut. C. Courtneidge, Som. L.I., and to be transferred to Gen. List; Temp. 2nd Lieut (on prob.) J. S. Williams, Gen. List.

Assistant Equipment Officers.—Aug. 31st: Temp. Capt. (Qmr. and Hon. Lieut., R.A.M.C. (T.F.)) H. S. Cleghorn, R.E.; Temp. 2nd Lieut. G. K. Shepherd, Gen. List; Temp. 2nd Lieut. D. B. Cleghorn, Gen. List. 2nd Lieut. L. B. W. Jolley, Spec. Res.; Sept. 14th. Sept. 18th: 2nd Lieut. (Temp. Lieut.) E. Gayton, R.A., and to be secd.; 2nd Lieuts. (on prob.), Spec. Res.—P. R. Hutchinson, T. T. Cumming; 2nd Lieut. H. E. Steinberg, Spec. Res.; 2nd Lieuts. (on prob.), Spec. Res.—A. L. Challis, W. F. J. Matthews; Temp. 2nd Lieut. G. M. J. Denman, Gen. List; 2nd Lieuts (on prob.), Spec. Res.—A. E. Biggs, H. I. Allen, E. M. Leete, A. D. Robertson.

Memoranda.—The undermentioned Warrant and N.C.Os., from R.F.C., to be 2nd Lieuts. for duty with R.F.C.: Sergt.-Major H. C. Williamson; June 22nd. Acting Sergt.-Major Petch, Flight Sergt. W. Millett; June 23rd. Sergt.-Major L. Ankers, Acting Sergt.-Major W. H. Clover; July 1st. Sergt.-Major J. E. Street, Acting Sergt.-Major J. H. Winch, Acting Sergt.-Major H. Jones; July 10th. Flight Sergt. F. Pratt; Oct. 1st. Sergt.-Major J. Rigby, Sergt.-Major O. W. Latimer, Acting Sergt.-Major W. Sharp, Acting Sergt.-Major W. G. Stafford, Acting Sergt.-Major C. L. Archbold, Acting Sergt.-Major W. C. Clark, Acting Sergt.-Major J. Rylands, Flight Sergt. F. R. Wilkins, Flight Sergt. A. Hawley, Sergt. D. A. R. Chapman, 1st Class Air Mechanic E. G. Webber; Oct. 12th. The undermentioned N.C.Os., from R.F.C., to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Flight Sergt. E. F. Hall; Aug. 28th. Flight Sergts.—E. Drudge, E. M. Cashmore, A. F. Lang; Sergts.—F. Grattan, R. G. Fussell; 1st Class Air Mechanics—E. R. Danks, J. O. Cooper; 2nd Class Air Mechanic—C. Rayner; Oct. 12th. The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Corpl. V. C. Legg, from Birmingham University O.T.C.; Sept. 11th. Pte. W. V. Radford, from Inns of Court, O.T.C.; Sept. 21st. Pte. P. G. White, from Lond. R. (T.F.); Sept. 30th. Acting Coy. Sergt.-Major G. W. Y. Swanson from A.O.C.; Oct. 8th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. to be Lieuts.:—Aug. 1st: D. B. James, C. C. Godwin, D. A. Hansard, G. de L. Wooldridge, W. N. M. Dunkley. Sept. 1st: (Temp. Capt.) S. C. Callaghan, (Temp. Capt.) K. K. Horn, (Temp. Capt.) A. T. Whitelock, R. G. Bennett, (Temp. Capt.) J. H. Herring, G. G. Hubbard, C. W. Hill, J. G. Western, (Temp. Capt.) R. F. S. Morton, V. D. Bell, G. Somers-Clarke, A. Charig, (Temp. Capt.) W. P. Cort, E. H. Pullinger, M. Minter, L. A. McDougald, A. T. Thompson, E. Selby, (Temp. Capt.) J. L. Chalmers, L. C. Kidd, (Temp. Capt.) A. Heywood, (Temp. Capt.) F. Shumaker, B. W. Watts, (Temp. Capt.) B. May, T. W. Winter. The Christian names of 2nd Lieut. (on prob.) Alfred Edwin McKay are as now described, and not as in the *Gazette* of Mar. 27th. The notification in the *Gazette* of Sept. 18th of the appointment of C. G. Mallous as 2nd Lieut. (on prob.) is cancelled. The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: A. N. David, W. M. Carlyle, F. S. Schell, P. B. Pattison, H. F. Steinberg, J. B. Ackroyd, D. J. Bell, L. R. Kerridge, W. R. Bowick, N. E. Chandler, A. Carruthers, E. F. Nash, C. Musgrave, A. Clark. The undermentioned to be 2nd Lieuts.: F. W. Beard; Aug. 18th. C. B. Willcocks; Aug. 24th. The undermentioned to be 2nd Lieuts. (on prob.): C. B. Mulville; Sept. 21st. A. C. Day; Sept. 25th. A. T. Griffith, F. H. Jefferis; Sept. 30th. H. Townend, T. Tatton; Oct. 1st.

London Gazette Supplement, October 12th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: Lieut. C. E. Wardle, Spec. Res.; Sept. 6th. Temp. 2nd Lieut. L. F. Forbes, Gen. List; Sept 24th. 2nd Lieut. H. A. Taylor, R.W. Kent R.; Sept 25th. Lieut. C. H. Gardner, 1st Welsh (Howitzer) Brig., R.F.A. (T.F.); Sept. 29th.

Flying Officers.—Sept. 14th: Lieut. C. R. O'Brien, R. Lanc. R., and to be secd.; Temp. 2nd Lieut. E. B. Mason, Bord. R., and to be transferred to Gen. List. Sept. 17th: Temp. 2nd Lieut. J. V. Aspinall, Gen. List; 2nd Lieut. M. Hayne, Lanc. Fus., and to be secd.; 2nd Lieut. E. S. P. Hynes, E. Kent R., and to be secd.; 2nd Lieut. (on prob.) P. McL. Haarer, Spec. Res. Sept. 19th. Sept. 20th: Temp. 2nd Lieut. K. B. Wild, R. Suss. R., and to be transferred to Gen. List; 2nd Lieut. L. C. F. Lukis, Essex R., and to be secd.; 2nd Lieut. N. E. Chandler, Spec. Res.; Sept. 21st. Sept. 22nd: Temp. Lieut. F. J. Roberts, Gen. List, from a Flying

Officer (Obs.), with seniority from Feb. 12th; Temp. 2nd Lieut. (Temp. Lieut.) J. A. Barton, Gen. List, from a Flying Officer (Ob.), with seniority from Apr. 1st; 2nd Lieut. S. A. Sharpe, R.A., from a Flying Officer (Ob.), with seniority from May 4th; 2nd Lieut. E. R. Davis, Worc. R., from a Flying Officer (Ob.), with seniority from May 29th. Sept. 23rd: Lieut. (Temp. Capt.) G. B. Lockhart, Highland Cyclist Bn. (T.F.); 2nd Lieut. H. A. Prosser, Northn. R., and to be secd.; 2nd Lieut. C. Musgrave, Spec. Res.; Temp. 2nd Lieut. E. Nightingale, E. Kent R., and to be transferred to Gen. List; Temp. 2nd Lieut. J. H. Tyler, K. R. Rif. C., and to be transferred to Gen. List; 2nd Lieut. A. C. Woodman, Lond. R. (T.F.); Temp. 2nd Lieut. (on prob.) G. Douglas, High. L.I., and to be transferred to Gen. List; Temp. 2nd Lieut. H. Kirton, Gen. List; 2nd Lieut. E. C. H. R. Nicholls, R. W. Surr. R., and to be secd.

Equipment Officers, 2nd Class.—From Asst. Equipment Officers:—Sept. 26th: Lieut. W. H. Day, Hamps. R.; 2nd Lieut. S. Davenport, Spec. Res., and to be Temp. Lieut. whilst so employed; 2nd Lieut. W. J. Sinclair, Spec. Res., and to be Temp. Lieut. whilst so employed.

Adjutants.—From Asst. Equipment Officers:—Sept. 15th: Temp. Lieut. R. C. Lane; Lieut. G. C. Gold, Spec. Res.

Memorandum.—Pte. Leonard Charles Welford, from 2nd Canadian Divl. Supply Col., to be Temp. 2nd Lieut. for duty with R.F.C.; Oct. 2nd.

London Gazette, October 13th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed:—Sept. 1st: Lieut. W. L. Robinson, V.C., Worc. R.; 2nd Lieut. A. de B. Brandon, D.S.O., Spec. Res. From Flying Officers: Capt. G. W. D. Allen, L'pool R., Spec. Res.; Sept. 23rd. 2nd Lieut. (Temp. Lieut.) G. W. Robarts, R.F.A., Spec. Res., and to be Temp. Capt. whilst so employed; Sept. 27th.

Equipment Officer, 1st Class.—Qr.-Mr. and Hon. Lieut. S. J. Payne, R.F.C., from Adjutant, and to be Temp. Capt. whilst so employed; Sept. 1st.

Flying Officers.—2nd Lieut. (on prob.) A. E. Neal, Spec. Res.; Sept. 21st. Sept. 22nd: 2nd Lieut. C. Parkinson, E. Lan. R. (T.F.); 2nd Lieut. W. L. Wells, Middx. R. (T.F.); 2nd Lieut. L. H. Jull, N. Staff. R., Spec. Res., and to be secd.; 2nd Lieut. P. L. Stephens, Welsh R. (T.F.); Temp. 2nd Lieut. T. S. Stewart, R. Suss. R., and to be transferred to Gen. List; 2nd Lieut. W. R. Bowick, Spec. Res.; Lieut. A. C. Maund, 8th Canadian Inf. Bn., from a Flying Officer (Ob.), with seniority from May 31st; Lieut. F. Workman, R. Ir. Rif., Spec. Res., and to be secd.; Temp. 2nd Lieut. G. C. Hoskins, Gen. List; 2nd Lieut. D. J. Bell, Spec. Res.; 2nd Lieut. (on prob.) C. Kennard, Spec. Res. 2nd Lieut. O. M. Sutton, S. Lan. R., Spec. Res., and to be secd. Sept. 23rd. Sept. 24th: Lieut. C. S. Morice, Worc. R., and to be secd.; 2nd Lieut. J. N. K. Shepherd, Northn. R., Spec. Res., and to be secd.; 2nd Lieut. A. Carruthers, Spec. Res.; Sept. 25th. Temp. Lieut. H. D. Harman, Glouc. R., and to be transferred to Gen. List; Temp. 2nd Lieut. C. O. Bean, Dorset R., and to be transferred to Gen. List; Temp. 2nd Lieut. V. H. Baker, R. Welsh Fus., and to be transferred to Gen. List.

Flying Officers (Observers).—Sept. 26th,: Temp. Capt. A. W. Field, Machine Gun Corps, and to be transferred to Gen. List; 2nd Lieut. (Temp. Lieut.) P. C. Purser, A.S.C. (T.F.); Temp. 2nd Lieut. W. O. Thomas, R. W. Fus., and to be transferred to Gen. List; 2nd Lieut. (on prob.) A. J. Bott, R.G.A., Spec. Res.; Temp. 2nd Lieut. (on prob.) H. Good, Middx. R., and to be transferred to Gen. List. Sept. 27th: Lieut. F. G. B. Reynolds, Oxf. and Bucks L.I. (T.F.); Temp. Lieut. G. M. Garro-Jones, S. Wales Bord., and to be transferred to Gen. List; Temp. Lieut. C. C. Statt, Oxf. and Bucks L.I., and to be transferred to Gen. List; 2nd Lieut. J. M. Stubbs, 3rd Hrs., and to be seconded; Temp. 2nd Lieut. R. M. Collingwood, York. and Lanc. R., and to be transferred to Gen. List; 2nd Lieut. L. H. Scott, Middx. R., (T.F.); Temp. 2nd Lieut. W. F. Findlay, K.O. Sco. Bord., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) D. P. Cox, Gen. List.

Adjutant.—Capt. J. C. R. Gannon, 23rd Cav. Ind. Army, vice Qmr. and Hon. Lieut. (Temp. Capt.) S. J. Payne, R.F.C.: Sept. 1st.

Equipment Officers, 3rd Class.—Sept. 1st: 2nd Lieut. A. Clark, Spec. Res.; 2nd Lieut. (on prob.) J. M. Heesem, Spec. Res. Sept. 18th: 2nd Lieut. (Temp. Capt.) C. Higham, Manch. R. (T.F.); Temp. 2nd Lieut. W. H. Tyler, Worc. R., and to be transferred to Gen. List; 2nd Lieut. (on prob.) N. Greenwell, Spec. Res.; Temp. 2nd Lieut. (on prob.) H. S. Hawkes, Middx. R., and to be transferred to Gen. List; Temp. 2nd Lieut. W. E. Phillips, Gen. List; 2nd Lieut. (on prob.) E. F. Cameron, Spec. Res.; 2nd Lieut. (on prob.) T. Woodman, Spec. Res.; Temp. 2nd Lieut. J. L. Dearing, Gen. List.

The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Sergt. L. P. Ball, from Lond. R. (T.F.); Sept. 25th. Corpl. C. F. Wormull, from Lond. Electrical Engrs. (T.F.); Oct. 1st.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. A. McKay, A. E. McKay.

London Gazette Supplement, October 14th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed:—Oct. 1st: Lieut. R. H. B. Ker, 3rd Pioneer Bn., Canadian Expeditionary Force; 2nd Lieut. K. H. Riversdale-Elliot, Sco. Rif.; 2nd Lieut. E. G. Landon, Spec. Res. 2nd Lieut. (Temp. Lieut.) C. M. Leman, Essex and Suffolk R.G.A. (T.F.); Oct. 2nd. 2nd Lieut. S. E. Cowan, Spec. Res.; Oct. 3rd.

Flying Officers.—2nd Lieut. C. A. Pike, Spec. Res.; Sept. 20th. 2nd Lieut. O. B. Howell, Spec. Res.; Sept. 23rd; Sept. 24th: 2nd Lieut. (on prob.) E. B. Cahusac, S. Staff. R., Spec. Res., and to be secd.; 2nd Lieut. (on prob.) F. Williams, Spec. Res. Sept. 25th: Lieut. J. S. Hodges, R. Fus., Spec. Res., and to be secd.; Temp. Lieut. B. D. Willoughby, A.S.C., and to be transferred to Gen. List; Temp. 2nd Lieut. (Temp. Lieut.) W. Baillie, Gen. List, from a Flying Officer (Ob.), with seniority from April 1st; 2nd Lieut. P. A. Russell, 2nd Lovat's Scouts Yeo. (T.F.); 2nd Lieut. (Temp. Lieut.) H. W. McGowan, K.O. Sco. Bord. (T.F.); 2nd Lieut. W. C. Thomas, R. Scots (T.F.); Temp. 2nd Lieut. R. K. Morris, Durh. L.I., and to be transferred to Gen. List; Temp. 2nd Lieut. J. A. Kirker, Gen. List; Temp. 2nd Lieut. S. H. Preston, Gen. List; 2nd Lieut. G. S. McGregor, Spec. Res. Sept. 26th: 2nd Lieut. (Temp. Lieut.) N. Hargreaves, E. Lan. R. (T.F.); Temp. 2nd Lieut. K. Crawford, Machine Gun Corps, and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) C. A. Brown, Gen. List; Temp. 2nd Lieut. (on prob.) J. H. R. Sutherland, Gen. List. Sept. 27th: Temp. 2nd Lieut. J. C. C. Affleck, York. R., and to be transferred to Gen. List; Temp. 2nd Lieut. E. L. Zink, Suff. R., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) E. T. Dunford, Gen. List.

Equipment Officer, 2nd Class.—2nd Lieut. E. E. Robb, Spec. Res., from an Asst. Equipment Officer, and to be Temp. Lieut. whilst so employed; Sept. 26th, 1916.

Equipment Officer, 3rd Class.—2nd Lieut. (on prob.) A. V. Sutton, R.G.A., Spec. Res.; Sept. 18th.

Memoranda.—Temp. 2nd Lieut. E. V. D. Mathews, D. of Corn. L.I., to be transferred to Gen. List, and to be Temp. Lieut. whilst serving with R.F.C.:—Sept. 1st: The under-mentioned 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: S. E. Pither, K.O. Sco. Bord.; R. H. Peto, 10th Hrs.; J. H. Mansfield, Shrops. L.I.; A. H. Goldie, Bedf. R.; K. H. Riversdale-Elliott, Sco. Rif.; B. P. G. Beanlands, Hamps. R.; W. McKay, Sea. Highrs.; A. L. Macdonald, R. Highrs.; A. J. G. Styran, R.F.A.; H. R. D. Simpson, 6th Dns.; M. H. Strange, R. Fus.; D. H. De Burgh, R.A. The under-mentioned 2nd Lieuts., Spec. Res., to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: S. L. Pettit, R. Fus.; F. W. Morter, R. War. R.; T. R. Irons, York. and Lanc. R.; J. C. Hodges, R.G.A.; E. M. Gilbert, Essex R.; A. G. D. Gavin, R. Highrs.; F. St. J. F. N. Echlin, R. Fus.; C. F. Denning, R.W. Surr. R.; P. C. Campbell, Arg. and Suthd. Highrs.; C. L. Bullock, Rif. Brig.; E. L. B. Buchanan, R.F.A.; A. J. Bott, R.G.A.; G. K. Macdonald, Notts and Derby R.; G. A. Turner, Dorset R.; V. A. Stookes, 2nd Dns.; E. W. Edwards, R.W. Surr. R. The under-mentioned Temp. 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: S. F. P. Polhill, R.E.; C. C. Miller, W. Rid. R.; V. A. Strauss, A.S.C. Temp. 2nd Lieut. (on prob.) J. V. Lyle, Gen. List, is confirmed in his rank. 2nd Lieut. (on prob.) H. C. Short, from R.F.C., Spec. Res., to be Temp. 2nd Lieut. on Gen. List for duty with R.F.C.; July 22nd.

Supplementary to Regular Corps.—2nd Lieut. H. M. Fleming relinquishes his commission on appointment to R.N.V.R.; Sept. 30th. 2nd Lieut. (on prob.) the Hon. C. E. St. G. Caulfield relinquishes his commission on account of ill-health;

Oct. 15th. The under-mentioned resign their commissions :—Oct. 15th : 2nd Lieut. G. G. Samuel, 2nd Lieut. J. B. Fitzsimons, 2nd Lieut. (on prob.) M. Hughes, 2nd Lieut. (on prob.) G. Smith. The under-mentioned 2nd Lieuts (on prob.) are confirmed in their rank : O. B. Howell, F. B. B. Shand, A. E. Neal, E. F. Cameron, G. S. McGregor, R. W. Mitchell, C. A. Pike, M. R. Grover, A. C. Smith, G. H. Warneken, H. W. Robinson. The under-mentioned to be 2nd Lieuts. (on prob.) : G. F. Harmer ; Oct. 2nd. N. H. England ; Oct. 9th.

London Gazette Supplement, October 16th.

Flight-Commanders.—Major E. H. M. O'Farrell, R. Ir. Fus., from a Flying Officer (Ob.) ; June 29th, 1916. From Flying Officers, and to be Temp. Capts. whilst so employed : 2nd Lieut. A. L. Gordon-Kidd, D.S.O., 4th Dn. Grds. ; Oct. 2nd, 1916. Oct. 3rd, 1916 : 2nd Lieut. L. F. Hursthouse, Spec. Res. ; 2nd Lieut. S. F. Heard, Spec. Res. Lieut. J. D. Latta, Spec. Res. ; Oct. 4th, 1916.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C. : Corpl. W. M. Edwards, from Lond. Brig., R.F.A. (T.F.) ; Sept. 4th. Gunner C. Rawdon-Schofield, from H.A.C. (T.F.) ; Oct. 7th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) resign their commissions :—Oct. 17th : S. Douglas, H. J. Every. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank : R. E. Chadderton, P. McL. Haarer, F. H. Humphreys, D. K. Sworder, H. C. Baker, G. Lea, C. E. S. Russell, N. Greenwell, W. E. Bousfield, F. Williams, J. Wheatland-Clinch, W. G. Cooke, E. M. A. Van-der-Meersch, D. B. Thorp, H. Tallis, R. T. Royse, E. C. McKenzie-Martyn, G. E. Osmond, J. M. Heesem, C. S. Hickie, E. R. Yates, P. H. S. Gwilliam, P. R. Hutchinson, A. W. McAuslane, J. Goodenough, R. R. Richards, C. R. Fleming-Williams, M. F. A. Paine, F. O. Gibbon, C. J. W. Hosken, A. W. Thompson, H. J. Barwick, D. L. Hollis, W. T. Curtis, C. H. Butcher, H. B. Golding, J. J. Lovesay, J. A. McOnie to be 2nd Lieut. (on prob.) ; Sept. 18th.

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THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Oct. 10th, 1916 ..	10,854	6	5
Staff and Workers of Gwynnes, Ltd. (Twenty-fifth contribution)	8	16	2
Collected at the Westland Aircraft Works, Yeovil (Fifty-second contribution)	0	16	6
Total, October 17th, 1916	10,863	19	1

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

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Another D.S.O. for Zepp. Strafing.

It was officially announced on October 13th that His Majesty the King has been graciously pleased to appoint Second Lieutenant Wulstan Joseph Tempest, General List and Royal Flying Corps, a Companion of the Distinguished Service Order, in recognition of conspicuous gallantry and devotion to duty in connection with the destruction of an enemy airship.

Honours for Zepp. Strafers.

From the record of appointments in the Royal Flying Corps on page 899, it will be seen that both Lieut. W. L. Robinson, V.C., and Second Lieut. A. de B. Brandon, D.S.O., M.C., have been promoted Flight-Commanders and to be Temporary Captains whilst so employed.

On October 14th the parishioners in the little village in Essex among whom they have been located for some time, presented Capt. Robinson and Lieuts. Sowrey and Tempest with handsome silver cups as a memento of their deeds. There were about 3,000 subscribers to the fund for purchasing the cups.

Military Medals for the R.F.C.

In the list of awards of the Military Medal for bravery in the field, published in a supplement to the *London Gazette* on October 11th, the following appear :—

491 Flight-Sergt. (now 2nd Lieut.) W. H. Bowker, R.F.C.
335 Flight-Sergt. (acting S.M.) S. G. Drake, R.F.C.
8485 2nd Air-Mech. T. J. Lewis, R.F.C.
252 Flight-Sergt. (acting S.M.) D. Martin, R.F.C.
4469 Sergt. J. Noakes, R.F.C.
2776 1st Air-Mech. R. H. Stead, R.F.C.
1196 Sergt. C. W. Waitt, R.F.C.
19930 Corpl. W. A. Ward, R.F.C.

Air Work in Mesopotamia.

In the despatch—published in a supplement to the *London Gazette* on October 12th—from Lieut.-General Sir Percy Lake, dealing with the final operations for the relief of Kut-el-Amara, there are the following references to air work :

"In the hope of prolonging the resistance of Kut for even a day or two, the Royal Flying Corps and Royal Naval Air Service had dropped into Kut, between April 16th and April 29th, approximately 8 tons of supplies, besides fishing-nets, medicines and specie. Although these supplies could not materially alter the course of the siege, it was a performance which is deserving of high praise, for it involved a great strain on the pilots, and the journeys were subject to attacks by enemy aircraft of superior speed and fighting capacity. One of our machines was shot down while engaged on this supply service, another was damaged, but brought home safely with great skill.

"The Air Service, which includes both the Royal Naval Air Service and the Royal Flying Corps, has distinguished itself throughout by hard work and devotion to duty, and the assistance which it has afforded to the other arms has been invaluable. Never fully manned, it found itself, towards the end of the last advance, very short-handed and faced by one or more enemy machines of considerably greater speed and fighting capacity, but its efficient work was nevertheless maintained."

Fatal Accidents.

While flying at Montrose on October 13th a machine, piloted by Second Lieut. Morrison, R.F.C., nose-dived from a comparatively low altitude, and the pilot was killed instantly.

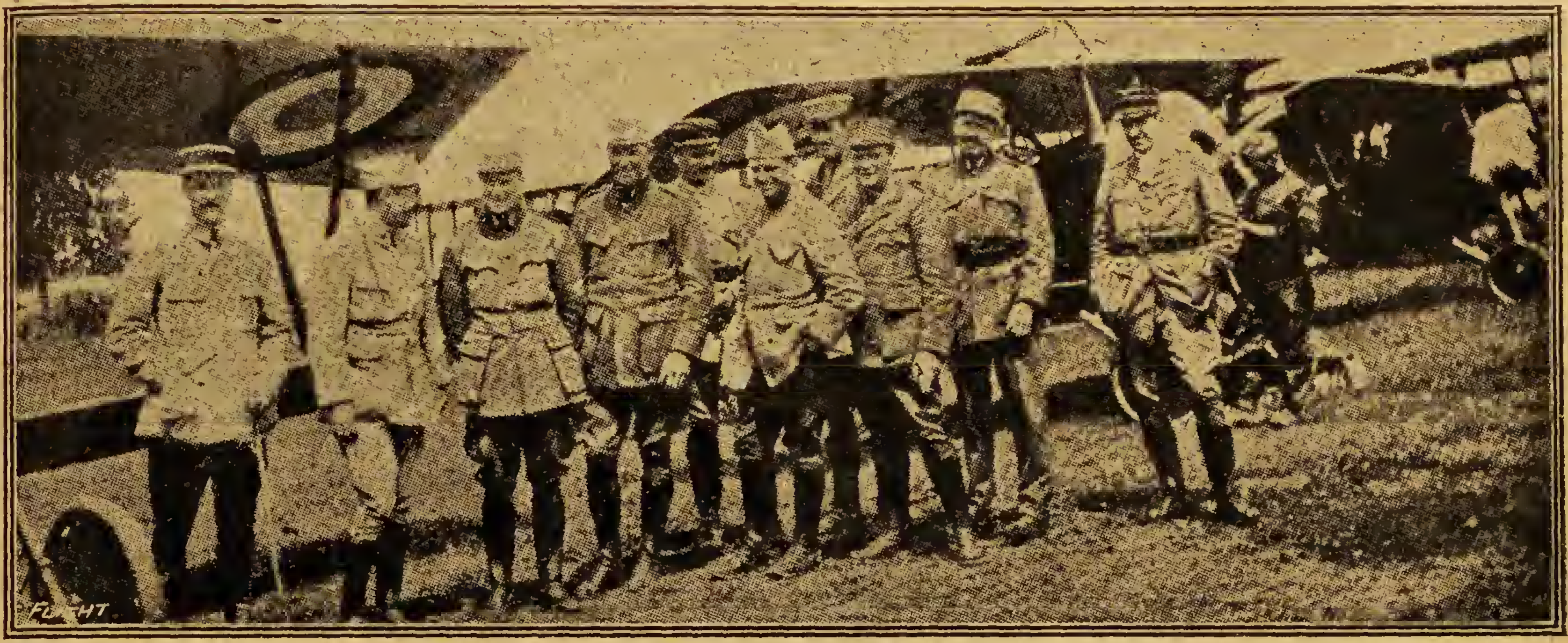
A verdict of "Accidental Death" was returned on October 14th on Petty Officer Mechanic W. H. Hodgson, who was drowned in the River Medway. The evidence showed that he was acting as an observer on a seaplane which side-slipped, then nose-dived from a height of 100 ft. and turned over. The pilot, Sub-Lieut. Mostyn Lewis, fell clear and tried to rescue Hodgson, but could not reach him. When the machine was raised from the water Hodgson was found across his seat entangled in the wreckage.

A Human Protest by Roumania.

Through M. Porumbaru, the Minister for Foreign Affairs, the Roumanian Government has sent a protest to neutral States against the bombardment of several towns in Roumania by German aeroplanes. It states that the only result has been the killing and injuring of more than 250 innocent victims, of whom over 200 were women and children. Fifty-eight bombs have been dropped on hospitals, asylums and almshouses. The Roumanian Government believes it is entitled to hold Germany directly responsible for the violation of Articles 25, 26 and 27 of the Regulations annexed to the Hague Convention, for it is German aeroplanes which fly over the towns, and it is under the orders of German commanders that the hostile armies are operating against Roumania.

THE NIEUPORT BIPLANE-SCOUT.

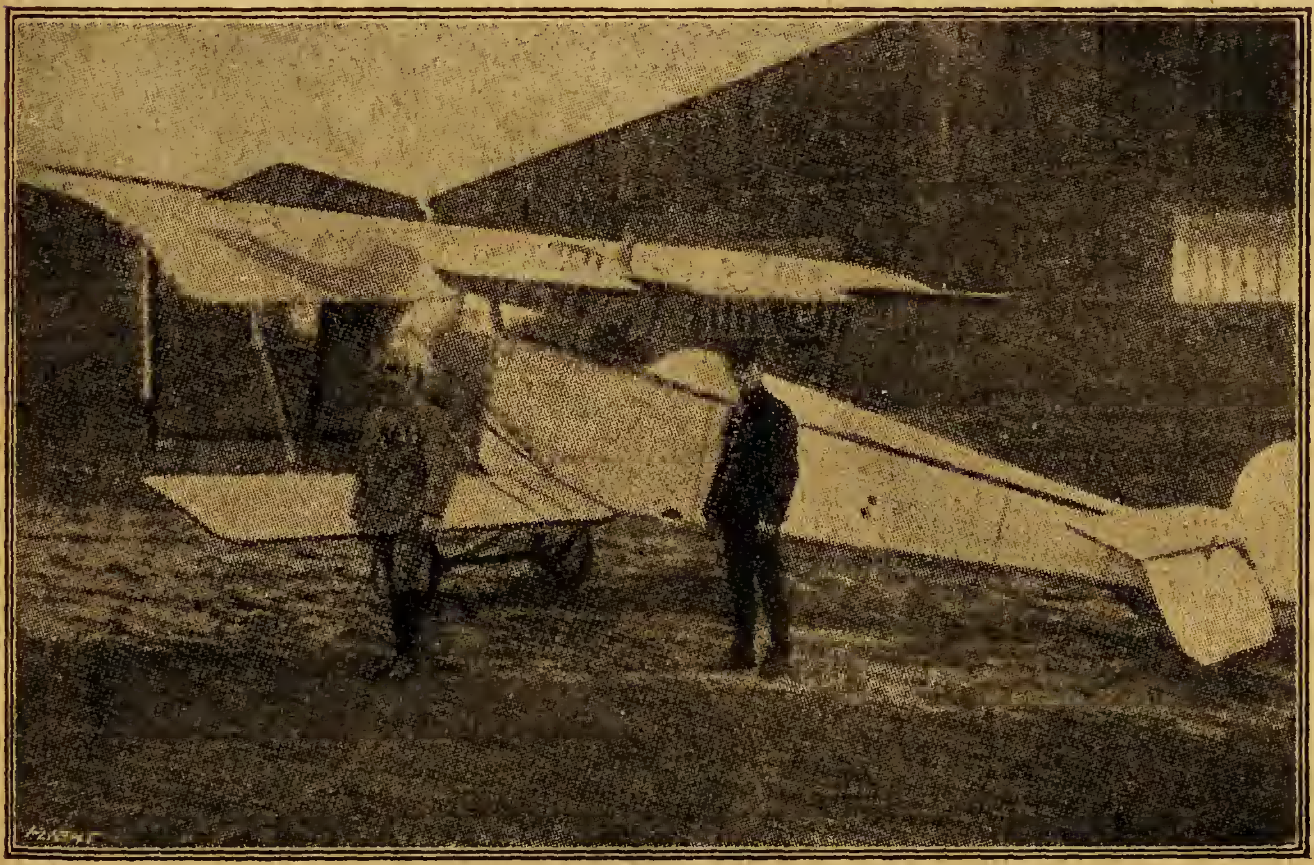
"SOMEWHERE in France" there is a little band of Americans, known as the American Escadrille, who are doing good work at the Front in the French flying service. The Nieuport "one-and-a-half-plane" is used by these American pilots, and we are indebted to our contemporary, *Aerial Age*, for the following description of this machine, the first model of which was illustrated in "FLIGHT" for March 19th, 1915.



(*Courtesy "Aerial Age."*)

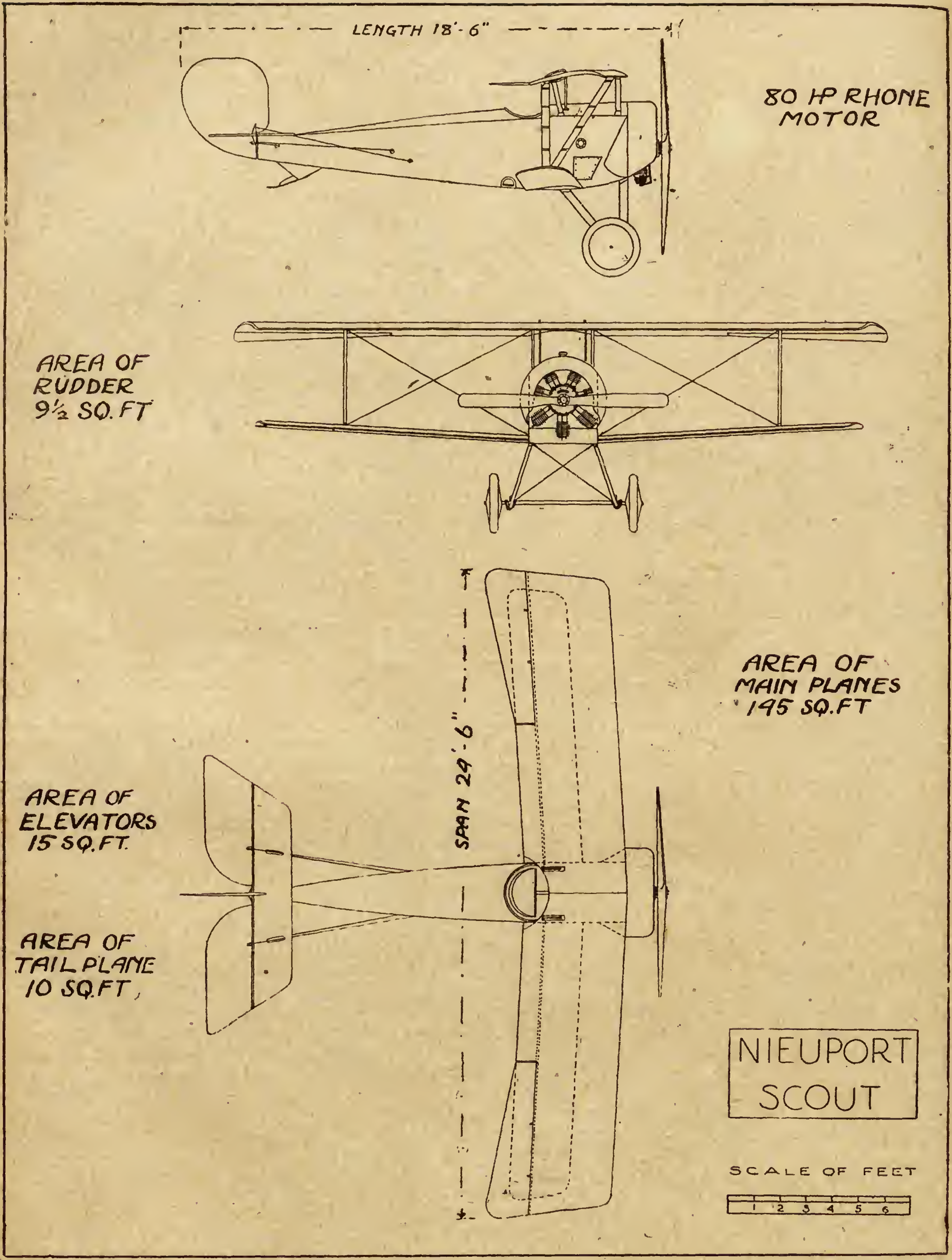
The American Escadrille and some of the Nieuport Scouts "somewhere" in France.—Reading from left to right are :—Lieut. de Laage, Sergt. C. C. Johnson (New York), Capt. Lawrence Rumsey (Buffalo), Sergt. J. R. McConnell (Carthage), Lieut. William Thaw (Pittsburgh), Sergt. R. Lufbery (New Haven, Conn.), Sergt. Kiffin Rockwell (Atlanta), Adjt. Didier Masson (Los Angeles), Sergt. Norman Prince (Boston), who has since died from wounds received last week, and Adjt. Bert Hall (Galveston).

The top plane has a span of 24 ft. 6 ins. and a chord of 3 ft. 11 ins., whilst the lower plane is 23 ft. span and 2 ft. 4 ins. chord. The narrow lower plane allows a good range of vision, and the trailing edges of top and bottom planes being in line produces the effect of staggered planes. Both planes are slightly swept back, and the lower one has a dihedral of about 8 ins. The upper plane, in two sections, is built up on two main spars 34 ins. apart. Above the pilot's seat the plane is cut away so that the pilot can easily reach the cockpit and also obtain a good view above to locate other aircraft or fire a machine gun. The *ailerons*, recessed in the upper plane only, are attached to tubes—indicated in the drawing by dotted lines—which run through the plane behind the rear spar to arms mounted above the *fuselage*. These arms are connected by rods passing inside the *fuselage* to a cross bar on the control column. This arrange-



(*Courtesy "Aerial Age."*)

Three-quarter rear view of the Nieuport scouting biplane.



THE NIEUPORT SCOUTING BIPLANE.—Plan, side and front elevation to scale.

ment is shown in the accompanying diagram. The gap between the rear spar and the leading edge of the *aileron* is covered by an extension of the plane-covering. Each section of the lower plane is 10 ft. 5 ins. span, and has a single spar situated 9 ins. from the leading edge, at the centre of pressure, the inner extremity forming the attachment to the *fuselage*. The attachment consists of a pivoted joint whereby the angle of incidence of the plane may be varied by rotating the spar by means of suitably arranged cranks and a hand lever.

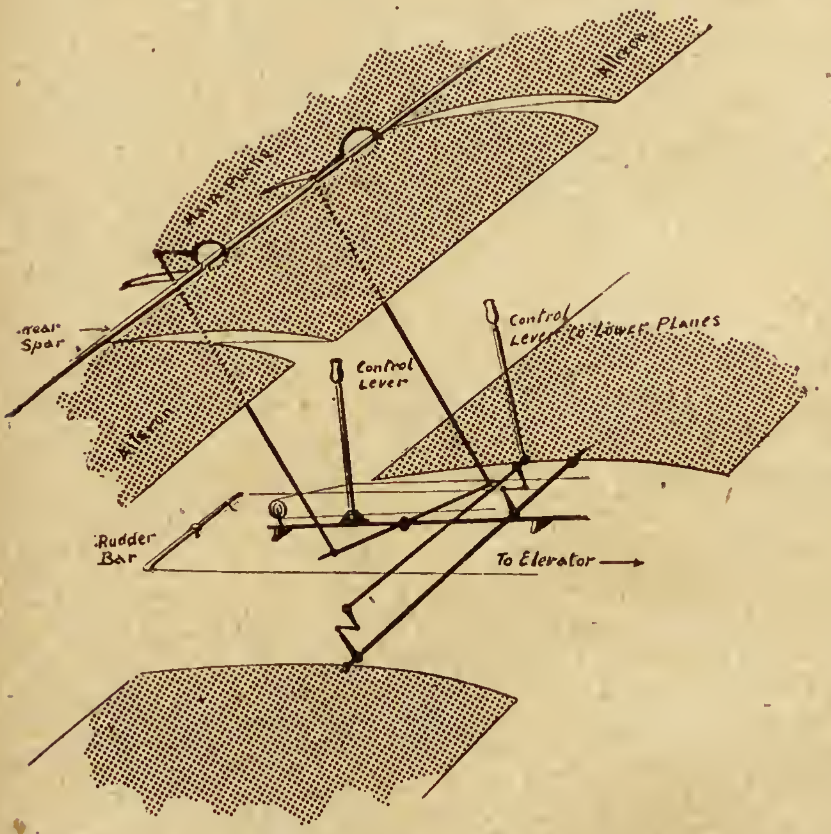


Diagram showing the controls for the *ailerons* and lower planes on the Nieuport scouting biplane.

Top and bottom planes are separated by one pair of struts on either side of the *fuselage*. Each pair, it will be seen, is in the form of a V, the struts converging at the bottom in a single strut-socket, which is so clamped around the spar that the latter may turn in it. The vertical member of the inclined V is 3 ft. 6 ins. in length, 4 ins. wide, with its upper end attached to the rear spar of the top plane. The inclined member is 3½ ins. wide, and has its upper end attached to the front spar of the top plane. The struts are streamlined and bound at 1 ft. intervals with silk fabric. Struts supporting the top plane above the *fuselage* are oval-section steel tube.

The tail planes consist of a non-lifting stabilising surface 1 ft. 5 ins. chord by 7 ft. 9 ins. mean span, two elevator flaps of about 15 sq. ft. area, and a large vertical rudder. The stabilising plane is stayed by steel tubes from the bottom of the stern-post, and its trailing edge, to which the elevators are hinged, consists of a steel tube. The rudder is also a steel tube, and is hinged to the *fuselage* stern-post.

The usual girder-box construction is employed for the *fuselage*, which has flat sides and bottom, a turtle-deck top following the curve of the engine cowel which is 40 ins. diameter. Vertical members are light, T section, and the covering is fabric back of the pilot's cockpit and three-ply veneer forward. The seat is a few inches from the *fuselage* bottom, and the wide cockpit allows for free movement of the arms. The *fuselage* is 33 ins. deep and 32 ins. wide at the cockpit, tapering to 12 ins. deep at the stern-post, whilst at the leading edge of the stabilising plane it is 8 ins. wide.

A V-type landing chassis is used, with a steel axle, sprung on rubber shock absorbers, carrying two 26 in. disc wheels spaced 5 ft. 4 ins. apart. The streamline chassis struts are 4 ins. wide and 1 in. thick, strongly cross-braced with cable. The tail skid, which is of ash with a steel plate shoe, is enclosed in a streamline shield of veneer. The control consists of a single vertical column in the centre of the cockpit operating the *ailerons* and the elevators by a side-to-side and forward-and-backward movement respectively, and a pivoted foot bar operating the rudder. The *ailerons* may also be operated by means of a foot bar entirely separate from the rudder bar. All openings in the *fuselage* for control cables are reinforced with aluminium rings, 2 ins. diameter, riveted to the fabric. Where the elevator cables go through the tail plane there are slots, 6 ins. long, with aluminium edges. Small and easily removable doors are located at either side of the *fuselage* permitting inspection and adjustment of the control levers, &c.

An 80 h.p. Rhone engine is used, coupled direct to an 8 ft. Levasseur tractor screw. The fuel tanks are situated at the rear of the engine in the top of the *fuselage*.

The following are the main characteristics of this machine: Span, top plane, 24 ft. 6 ins.; bottom plane, 23 ft.; chord, top, 3 ft. 11 ins.; bottom, 2 ft. 4 ins.; supporting area, 145 sq. ft.; gap, 4 ft. 2 ins. (centre), 3 ft. 5 ins. (tips); length overall, 18 ft. 6 ins.

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Monetary Rewards for Aviators.

An Army Order, dated October 16th, 1916, notifies an alteration to the King's Regulations by the insertion of the following paragraph :—

"443a. Officers, warrant officers, non-commissioned officers and men are forbidden to accept presents in money from public bodies or private individuals in recognition of services rendered in the performance of their duty."

Tramways and Air Raids.

At the meeting of the London County Council on October 17th, Mr. Hume stated that the Highways Committee had received a letter from the Finsbury Borough Council urging that steps should be taken to obviate danger to life and property by reason of sparks and flashes from tramways on the occasion of attacks on London by hostile aircraft. The question of the running of tramway cars during aid raids had been fully considered, and the extreme importance of the matter in relation to the protection of London was recognised. In the operation of the tramway services at times of threatened or actual air raids the Council acted in close touch with, and under the direction of, the military and police authorities.

Another Transatlantic Project.

From Copenhagen comes word of another proposal to fly across the Atlantic. This time it is the Swedish pilot, Capt. Hugo Sundstedt, who is said to have worked out his plan with the help of Mr. Henry Farman. He will, however, use a Curtiss type machine, and is now crossing to New York to personally superintend its construction. Details of the machine are not forthcoming, except that it will have six motors, each of 260 h.p., and will be able to fly 30 hours with three passengers. The Transatlantic voyage will be made from Newfoundland *via* Ireland.

ARMCHAIR REFLECTIONS

By the "Dreamer"

Although the sun is shining to-day, there is a nasty cold snap in the wind telling of the coming of winter. With a fire in my room for the first time, and the blinds closely screening all windows on account of the lighting regulations, the aspect is entirely cheerful; and so I can pull my armchair to the friendly blaze, whilst turning over the leaves of my pocket diary, to look for the falling of Christmas Day, the third Christmas of the war.

It is but a little over eight weeks. In eight weeks we should be making merry with holly and mistletoe, with presents and good cheer, with greetings of good fellowship, yet I think 1916 must be a dull old Christmas, and one full of sorrowings and heartaches.

I had hoped against hope that this ghastly business of killing would have been all over before another Yuletide, but it seems that it is not to be, and our boys must spend yet another one away from the friendly hearth, and the question is, what are we going to do for them?

I am afraid many of those diligent knitters of the early days have fallen off in enthusiasm, and that comforters and warm underclothing are not being supplied in such quantities as before, yet the winter will be just as severe, and warm clothing just as welcome. If "Sister Sue" does not feel quite so eager to sew as she did, our boys are not slacking off one bit in their determination to win through, even though half-a-dozen Christmasses come in between.

I know from personal letters received from the front what it is most desirable, from the boys' point of view, should be sent out. There are three more prominent things, warm comforters and knitted things, cigarettes and tobacco, and tinned fruits. A tin of peaches or pineapple is something to a man who is living on bully-beef and biscuits, and every man of him has got a dinky knife with a tin-opener in the end.

This war is a horrible business. Of all the stupid ideas ever entering the brain of man, surely war as a method of settling disputes is the stupidest. Just because somebody thinks he wants that which he has no possible right to have, millions of men must be sent to their death. If I had my way, the first person who hinted at the breaking off of "diplomatic relations" should be taken out and hanged on the nearest tree. Well, we can't hang him, at least not yet, and so in the meantime let us set about getting our little parcels ready. There is not a great deal of time to spare now, and there may be delay later on owing to the congestion of traffic, so let us set about it at once. A parcel arriving two days after Christmas is not in time to prevent our boy thinking that we had forgotten him or did not trouble overmuch.

Several times I have seen the Somme film, hoping each time that I should find a length added showing something of life in the Flying Services at the front, but I have not struck lucky yet. I can think of nothing the general public and those R.F.C. boys who have not yet been out, would take more interest in than a long film showing the life of men in the Flying Services on active service. It would be the delight of my life to be sent out there to photograph them and write them up, and I promise you I would make interesting pictures and reading. Apart from all else, I feel sure it would do an immense amount of good from the point of view of instruction to those who have not yet realised active service.

I will admit that until I saw the Somme Film, I had a very wrong idea of the life our boys were called upon to lead when fighting for their country, and the effect it had upon me was that I should like to be out there with them. I do not close my eyes to the ghastliness of the whole affair, but it has its compensations, of which Tommy knows how to take full measure.

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With the waning of the moon this week, I suppose we may expect further visits from the gas-bags, with the liberating of more hydrogen. We have come to look upon the flare-up as a pretty foregone conclusion after the last few visits, and shall wonder what is the matter if it is not repeated. It is strange that during the whole time the present moon has been with us to allay the fears of the nervous ones, the wind has also lent its aid in making raids an impossibility. Now that the moon is failing, I suppose the wind will also fail. However, the winter is upon us, when Zepps. will cease from troubling over-frequently. And, really, what have they done? At the end of a long summer, providing possibilities innumerable, the damage of a military nature done in all the numerous raids over this country amounts to nothing. Not once, so far as we are allowed to know, and I believe we know the truth, has a single building having a direct influence on the war been hit. Seeing the cost of these brutes, the trouble of organising a raid, and the expense of carrying it out, the game does not really appear to be worth the candle. I am doubtful whether the whole business of giant airships is of much account, anyway. Possibly as the eyes of a fleet, they would be most valuable, but failing that, and the small amount of damage they do here, and the fact that they do not appear to be able to use them over the trenches, what use are they? In my humble opinion, they are but things of a period, tried out and found wanting. I believe the work which they are supposed to do, and cannot, will on future occasions be done by the giant aeroplane. Everything appears to point that way at the moment.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to " Flight *" about it.*

J. B. W. (Monkseaton).

You are quite right in assuming that a rotary engine has a gyroscopic effect on an aeroplane when turning. Not only has the engine, but also the propeller, a gyroscopic effect, and it will even frequently be found that the effect of the propeller is greater than that of the engine. A numerical example will help to illustrate the magnitude of this gyroscopic couple. Let us take a rotary engine of 100 h.p., and assume that it is installed in an aeroplane flying at 100 m.p.h., and further, that the machine makes a turn in a complete circle of 400 ft. diameter. The gyroscopic couple is then expressed by the equation $M = m\lambda^2\omega\Omega$, where m = mass = weight of engine ÷ gravity. Taking the weight of a 100 h.p. rotary engine as 280 lbs., we have $m = \frac{W}{g} = \frac{280}{32} = 8{\cdot}75$. λ = radius of gyration of engine, which we shall take as 1 ft. ω = angular velocity of rotation, in radians per sec., and Ω = angular velocity of displaced axis, in this case the aeroplane's rate of turning. If we take the number of revolutions of the engine as 1,200 per min., we have $\omega = \frac{1,200}{60} \times 2\pi = 125$. As the machine flies at 146 ft./sec. and describes a circle of 200 ft. radius, it completes one circle in

$$\frac{2 \times 3{\cdot}1416 \times 200}{146} = 8{\cdot}6 \text{ sec.} \quad \therefore \Omega = \frac{2\pi}{8{\cdot}6} = 0{\cdot}73.$$

Substituting in the formula we have gyroscopic couple $= M = 8{\cdot}75 \times 1^2 \times 125 \times 0{\cdot}73 = 798{\cdot}4$. The gyroscopic couple is therefore 798·4 lbs. ft. If the area of the elevator is 13 sq. ft. and acts at a distance of 20 ft., the turn in question imposes a load of about 40 lbs. on the elevator, or nearly 3 lbs./sq. ft. It should be pointed out, however, that the fixed tail plane carries its share of this load. If the engine revolves clockwise (as seen from the pilot's seat), the effect of the gyroscopic couple in a left-hand turn will be a tendency for the tail to drop, a right-hand turn having, of course, the reverse effect. There are various advantages in multi-planes over biplanes, for the same reason that when a certain limit is reached the biplane construction is preferable, from the point of view of strength to weight ratio, to the monoplane. Thus, for very large machines, where it is desired to keep the span within reasonable limits for purposes of housing and other considerations, it may become common practice to resort to the multi-plane formation. Even for small machines there would appear to be certain advantages in employing three or four planes instead of the now usual two. For instance, although there is a certain amount of interference taking place with superimposed planes, this is partly counteracted by the fact that if each plane of a biplane is divided into two of the same overall span, the chord of each is halved and therefore the aspect ratio doubled. Also, in a narrow chord the travel of the centre of pressure is shorter, and it may become possible to use one strut only where a pair was formerly employed, thus saving resistance. We cannot say for certain what is the maximum attainable height for a modern Zeppelin with full load: probably some 15,000 ft.

H. B. (Fareham).

The disposition of the engine gondolas on the latest Zeppelins is not quite clear, but it appears that there is one in front, rather elaborately constructed with covered-in sides and top, and providing accommodation for the commander and helmsman. The engine of this front gondola, as far as we can make out, drives a single screw placed behind the gondola. The rear gondola appears to have contained three engines, two of which drive the side propellers, while the third drives a stern propeller. The observation car, when not in use, is probably placed in a recess in the keel of the main hull, so that the observer can enter it through a trap door in the communication passage running from the front to the rear gondola. Once inside the observation car, he would close the little trapdoor in the roof through which he entered and give the signal to be let down. With regard to the swinging of the car and its effect on the stability of the airship, the car is fitted with fins so as to keep it always head on to the wind, so that probably there is very little swinging. The number of ballonnets that would have to be pierced before the airship descended would depend on whether she was loaded or not at the time; if light, one or two of the ballonnets could probably be nearly emptied without necessarily forcing the airship down, as her engines would help to support her *via* the side propellers.

H. B. (Horsham).

A brief consideration will show why a very efficient machine may be more dangerous than a less efficient one when suddenly flattening out after a steep dive. Suppose that one machine flies at a speed of V m.p.h., and has, at that speed, a gliding angle of 1 in 6. If this machine is dived vertically, the earth's attraction is equal to the weight of the machine (W). The speed of the machine on the vertical dive (with the engine switched off) will continue to increase until the resistance 1/6W is increased to W. If the resistance is assumed to increase as V^2, the velocity at which the resistance is equal to W is $\sqrt{6}V = 2{\cdot}45V$. In other words, the maximum speed on a dive, with the engine switched off, is 2·45 times the normal flying speed. Now, suppose that it is possible to cut down resistance without altering any other of the aeroplane's characteristics until the gliding angle becomes 1 in 12. By the same reasoning as in the first case, the velocity at which resistance becomes equal to W is $\sqrt{12}V = 3{\cdot}464V$. It will be easily appreciated that a sudden flattening out will impose far greater stresses on the latter machine than on the former. We have even known designers who kept up body resistance for this reason, although in modern times and with careful piloting there is no necessity, nor apparently any tendency, to do so.

Airman (Portsmouth).

The pay of a Flying Officer is 12*s.* plus 8*s.* flying pay; when training 7*s.* 6*d.* a day. The kit allowance is, we believe, £50 for an officer appointed to the Special Reserve.

G. W. F. (Redcar).

See reply to "Airman" above. Apply to the Director-General of Military Aeronautics, Adastral House, London, E.C., for the necessary forms.

A. B. C. (Cheltenham).

We understand that up to the present there has been no need to provide for the contingency you suggest. If the officer's services could not be utilised in any way, no doubt he would be invalided out of the Service.

New Reader (Dublin).

A copy of "Flight" for December 10th, 1915, with scale drawings and description of the Fokker monoplane, can still be obtained, price 3½*d.* post free.

F. B. (Curragh).

There are no special qualifications, and you should apply in the usual way for a transfer to the R.F.C. as an Observer. If your application is granted you will be sent to a school for a course of training. Your experience should certainly assist you in your application.

M. (Norfolk).

The badge signifies that the officer is a qualified Observer attached to the R.F.C. The grounds you mention are Government training centres, and that explains why no reference can be made to the flying there.

S. G. T. (B.E.F.).

Apparently, as the injury was caused by an accident, you would not be entitled to wear the gold stripe.

Copyright, F. N. Birkett, from the F.N.B. Series of Aviators.

A Group of Pupils who have taken their Royal Aero Club Certificates recently at the Beatty School of Flying, Hendon.—(1) Messrs. P. Rudd, (2) J. W. Towson, (3) G. C. Champion, (4) W. G. Edwards, (5) A. W. Kay, (6) B. J. Curry, (7) R. H. New, (8) H. E. Martin, (9) H. V. M. Hoskins, (10) B. Roberts, (11) D. Mitchell, (12) G. W. Dowding, (13) A. W. Wood, (14) Mrs. C. E. Wilkinson, (15) Messrs. J. A. Davy, (16) C. W. Skeet, (17) F. W. Knox, (18) J. S. de Wilde, (19) B. J. Earl, (20) W. W. A. R. Murdoch, (21) H. J. H. Garlick, (22) W. E. Jones, (23) E. Venables, (24) G. McPherson, (25) R. A. S. Phillips, (26) P. S. Whitmore, (27) V. G. Austen.

AIRISMS FROM THE FOUR WINDS

"I SHOULD perhaps also have mentioned Sir Maurice Hankey, Secretary of the War Committee, to whom we are very considerably indebted for the first suggestion that something of this kind *should be tried.*"

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THUS—the italics are ours—Mr. Lloyd George, in the Commons last week upon the subject of to whom credit is due for the original putting forward the idea of the "Tanks" for strafing the Huns. It is quite conceivable that Mr. Lloyd George is correct in his statement that the suggestion they *should be tried* came from Sir Maurice. The Minister for War should assuredly be in the position to know. But what we, and most people are concerned about, is who was the man to lay originally the whole scheme—drawings, details and suggestions all complete—before the powers that be in *1914* soon after the start of hostilities. What is wanted is names in conjunction with dates. "FLIGHT" has already given his name, so there is no need to repeat it now. Possibly, as Secretary of State for War, Mr. Lloyd George has not the same opportunities of perusing our pages as he had as Munitions Minister, but it might be worth his while to have a glance at "FLIGHT" of September 21st, page 802, and then make a few inquiries in the right quarter.

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THEORETICALLY, according to the usual irresponsible Parliamentary Ministerial babble, pensions follow automatically the break-up or permanent invaliding out of our gallant men who joined up to fight the common enemy of the world. In practice the result is ghastly. Truly, it's about time a single Pensions Authority was appointed if cases on a par with the one quoted below are as common as it is alleged by Sir Frederick Milner, in a letter of indictment issued publicly this week. Sir Frederick, who is no sentimentalist, after quoting some horrible experiences of our poor maimed heroes, gives the following as "another shocking case in the Navy": "A young fellow earning 50*s.* a week as chauffeur, enlisted. His employer, who had him in his service several years, states he was never sick or sorry. The local doctor who knows him well, said he was as sound as a bell when he enlisted. He joined the Royal Air Service, and contracted consumption. He was awarded the handsome pension of 3*s.* 6*d.* a week for three months, or a magnificent total of £2 2*s.*" What an indictment of official ineptitude and national appreciation of our fighting men.

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WONDER if an "alibi clock" has anything to do with Zepp. raids in combination with summer time changes and the vagaries of street and house lighting. A solicitor in a case at the Stratford Police Court the other day described the mystic article thusly: "Some people tell the time by an alibi clock: it strikes twelve, the hands point to half-past four, and the right time is seven."

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A SIGN of the "coming of the aeroplane" is to be found in an incident which occurred last Friday. On that day the Stores Department at the Red Cross Headquarters in Pall Mall received an urgent request for an oil immersion lens for a microscope in a hospital laboratory at Calais. There being no boat available, the lens was despatched by aeroplane, and arrived both safely and in time.

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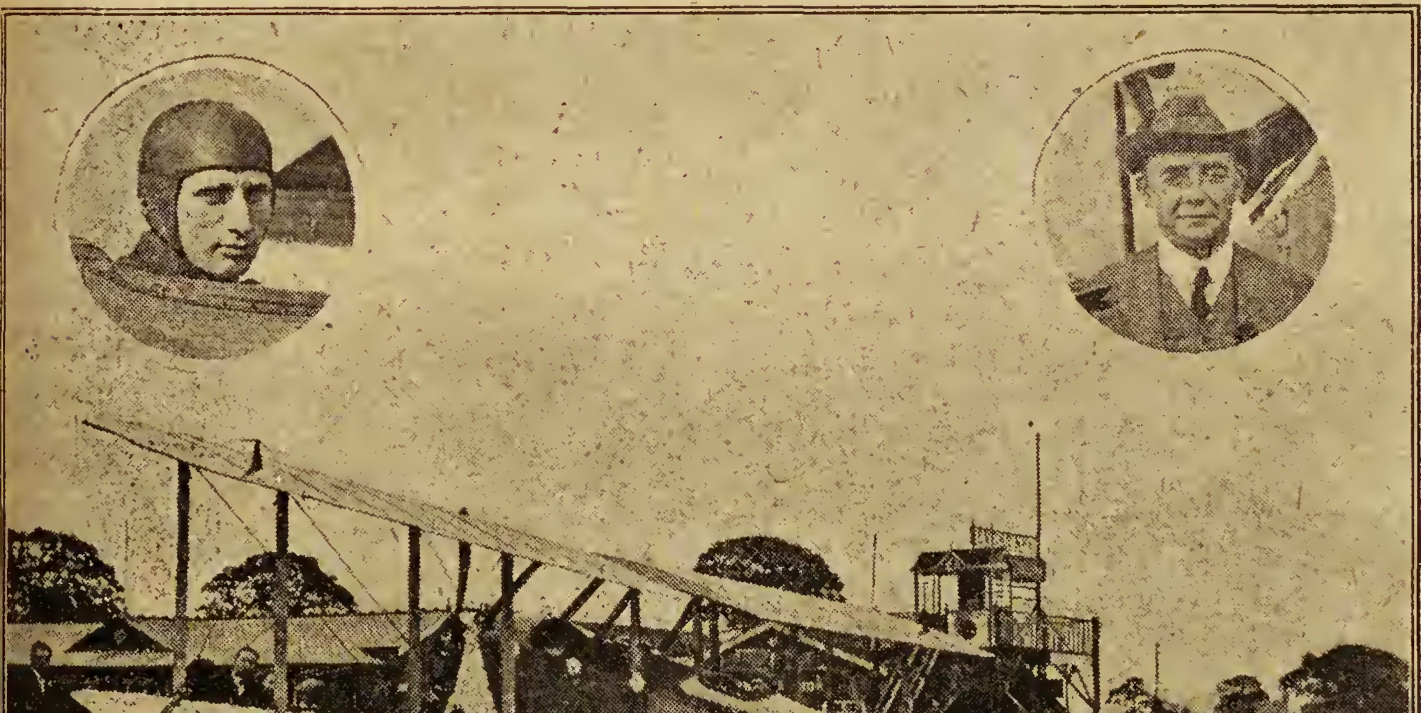
WHAT possesses the memento-hunting imbecile in times like the present to hunt for bits and pieces concerned with the Hun night marauders, and having secured some uncon-



A "Live" Combination.—A Martinsyde biplane and, inset, its pilot and pilot-owner, H. Sykes and C. H. Stevens. Sykes has for some time past been putting up wonderful stunts on this machine. Although bearing the marks of a nasty aeroplane smash experienced early in the year, Stevens was so keen on flying as to buy the machine and learn to fly it under the tutorship of Sykes.

sidered trifle, proceed to treasure it up in secret, without first ascertaining from the authorities whether the apparently useless item has any military value attached to it. It is almost inconceivable that it should be necessary for the authorities to issue peremptory notification to the effect that it has come to their knowledge that certain valuable documents, portions of note-books, &c., which fell from, or belonged to, a crew of the raiders, are still in the possession of members of the public, and asking for their return. It is to be hoped that these treasure trove seekers duly handed in their finds by Tuesday last, until which day grace was given by the military authorities, backed by the promise of a reward, or they will thoroughly merit the punishment which at the same time was threatened for non-compliance with the request. It must be obvious that there are considerable possibilities of valuable information for our military from documents and parts of the fallen aircraft which are still being held back.

* * *

NONE too soon the Government has permitted assistance to be given from the Prince of Wales' Fund to persons who have suffered in consequence of the recent night airship raid. These grants, which must not exceed £20 in each case, are purely by way of relieving distress, the lawyer wariness of the Government prompting the attachment of the condition that the grant is in no case "by way of compensation for damage." It is to be hoped that *all* the disbursements of this very magnificent Fund have been and will be as healthy as those which may result in this new departure.

* * *

ANTWERP is getting nervous of night trouble from the air.

* * *

SOME of our readers should be able to help Lady Drogheda—who has quite an original scheme in hand for November—to help forward her supply depôt at Moore Park and the Red Cross. Lady Drogheda has been a keen collector of aeronautical prints, and these she proposes to place on view at Bond Street Gallery. Her collection totals up to about 300, and already many others are promised on loan from famous private sources. A special attraction of the show should be a series of sketches by Mr. John Lavery of present-day aircraft, which carry with them the *cachet* of official permission. The little exhibition should attract a good "gate," and we feel sure Lady Drogheda will welcome any further additions to the exhibits.

* * *

SIGNIFICANT of the times was a bright light high up in the sky on Monday night, travelling at a great speed. Possibly in the years to come we shall take little notice of such happenings: just now it points to progress and adaptability.

* * *

WITH the letter Z standing for Zeppelin, is it an omen that the running letters R.S.T. are also at the tail end of the alphabet? They are the initial letters in proper rotation of the three strafers. Perhaps before long the gaps in the alphabet may be completed.

* * *

IT is a wonder that none of our clever cartoonists have struck the idea of drawing the statue of Liberty holding up a dollar in place of the torch. If it has been done we have not seen it, and it appears that it would fit all right.

* * *

NEXT year's Academy should include some interesting aeronautical subjects.

* * *

APPARENTLY the success of W. L. Wylie, Gordon Crosby and the late Cyrus Cuneo have set some of the R.A.s thinking.

* * *

WHAT about an aviation picture from the brush of Mr. John Lavery. A change from Society portraits.

* * *

MORE Hun strafing. 129,040 people visited the exhibition of Zepp. relics during the three weeks it was opened, and over £1,000 was deposited in the collecting boxes for the benefit of the City of London branch of the British Red Cross Society and the Lord Kitchener Memorial Fund.

* * *

PERHAPS one reason why the Zepps. have not visited Paris recently is because the old Count is anxious about those three "Louis" chairs which he ordered before war was declared and for which he sent the tapestries to Paris. Anyway, the Paris Courts have sequestrated them for the duration of the war.

Now we know how it is done! "Yes, it's wonderful how they bring them down," said Flapper No. 1 to No. 2 on the top of a 'bus, "they've got a new kind of searchlight, my dear; I've seen it. It's got a bright blob on the end that burns them up!" Well, perhaps the clouds will roll away one day, and we shall then know the exact strafing formula.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT'S" *precursor and sister Journal*) *of October*, 1906. "FLIGHT" *was founded in* 1908.

THE GORDON-BENNETT CUP.

The third place in the Gordon-Bennett Race, as we last week anticipated, has now definitely been awarded to the Hon. C. S. Rolls. The delay in placing him was due to the necessity of very carefully estimating the distances travelled by the third and fourth competitors.

M. SANTOS DUMONT'S AEROPLANE—SOME REFLECTIONS.

There is no further news of M. Santos Dumont's progress, for the natural and simple reason that his machine is probably still being repaired after the smash which we chronicled some time ago. Looking at the construction of the machine, two things impress one very forcibly—the enormous length of the front tail and the absence of a rear one. The front tail consists, as will be remembered, of a sort of girder projecting from the centre of the aeroplane proper, and on the end of this girder-like structure is carried a box, the upper and lower planes of which can be turned (parallel to one another), so as to direct the whole machine upwards or downwards. The top and bottom of this box, in fact, correspond to the two horizontal planes of the forward tail in the Wright machine, but their enormous distance, comparatively speaking, from the centre of gravity of the whole structure certainly disposes one to the belief that a very slight movement in either direction will produce very violent effects in altering the inclination of the whole machine, more violent than the skill of the aeronaut is likely to be able to control. This is certainly in accord with what has already happened, the machine rising, when it did rise from the ground, at a very considerable angle, and maintaining it till it struck the ground again, the propeller first touching the earth.

There certainly also appear to be grounds for supposing that something in the way of a rear tail will have to be adopted, for it is only a vertical rear tail that has hitherto, so far as can be judged, been successful in bringing an aeroplane into a horizontal position when, from gusts of wind or other causes, one side is lifted more than the other.

THE CORNU FLYING MACHINE.

Recent experiments with this machine, which have been conducted in the former Gillotin workshops, are said to have been remarkably successful. The machine was arranged so as to run along and be checked in its rise by a telescopic rod, which allowed it to rise 3 metres, and it rose in the air most satisfactorily and maintained a steady course. It was driven by a 2 h.p. motor, which actually gave 1½ h.p., and raised itself in the air with facility, its weight being nearly 14 kilogs. M. Cornu is proceeding to the construction of a considerably larger machine on the same principle, to be furnished with a 25–30 h.p. motor and designed to carry a passenger.

THE VUIA AEROPLANE.

Further experiments have been made with this machine recently at Issy-les-Molineaux. The apparatus, as our readers will call to mind, consists of a single pair of wide, outstretched wings, providing a total surface of 20 square metres, below which is suspended a rectangular frame running on four bicycle wheels and carrying the motor and propeller. A peculiarity of the arrangement is that the motor is driven by liquid carbonic acid, a method of obtaining power which has not hitherto been conspicuous for its lightness. The propeller on the machine, as it now exists, is two-bladed, and is 2·20 m. in diameter. During the recent experiments, which were made on a long flat road, sufficient lifting power was produced by the action of the propeller to cause, on one attempted flight, the four-bicycle wheels of the machine to leave no apparent tracks on the ground for a distance of 4 metres. On another occasion, when the aeroplane was given a slightly different angle, the two front wheels were lifted well into the air. Nothing more nearly approaching free flight was accomplished.

WEIGHT AND TORQUE OF AERO ENGINES.

In his presidential address before the Institution of Automobile Engineers, the incoming President, Mr. L. A. Legros, criticised at considerable length the educational system of this country. In his opening remarks, however, he summarised the progress made in the design of petrol engines, and gave some instructive tables of weights, &c., regarding aero engines, together with some graphs, which we reproduce.

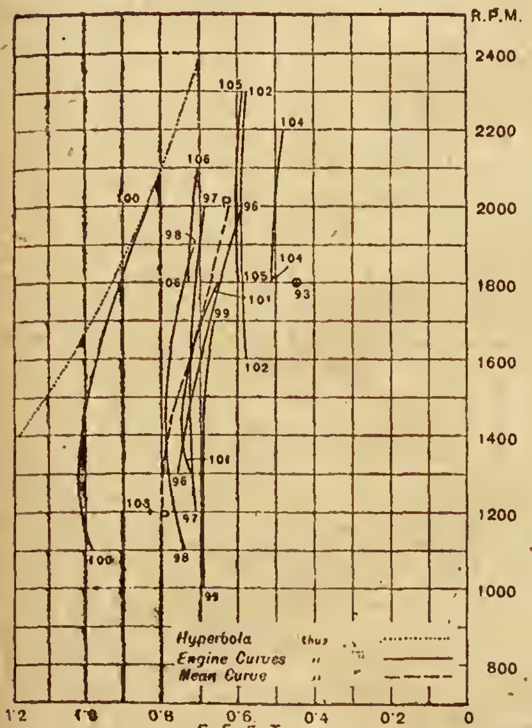


Fig. 1.—Equivalent radius; vee-type aero engines.

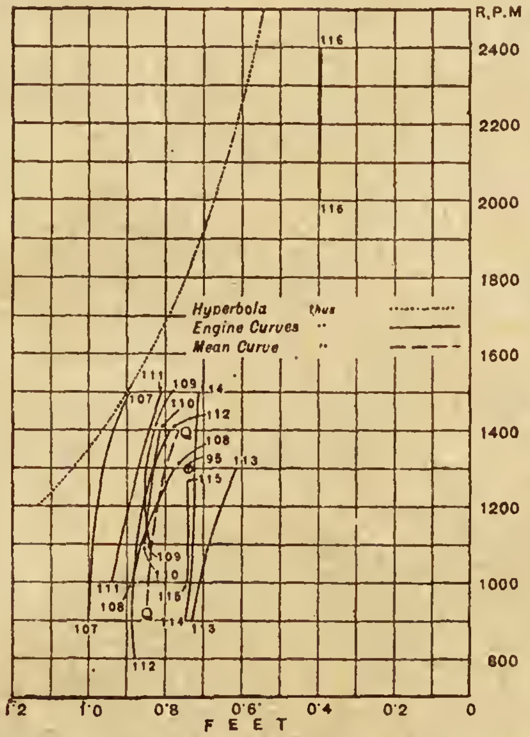


Fig. 2.—Equivalent radius; vertical-type aero engines.

He said: "It has been suggested to me by a former President, Lanchester, that the special function of the automobile engineer, as contrasted with those of other engineers, is weight-saving, and that this Institution may well be said to represent the Weight-Saving Engineers. Though it is quite true that weight-saving was the watchword of the cycle industry, to which this Institution owes its birth, yet on reflection it will be remembered that weight-saving has been an important factor in all the great advances that have been made in traction, whether on land or on water.

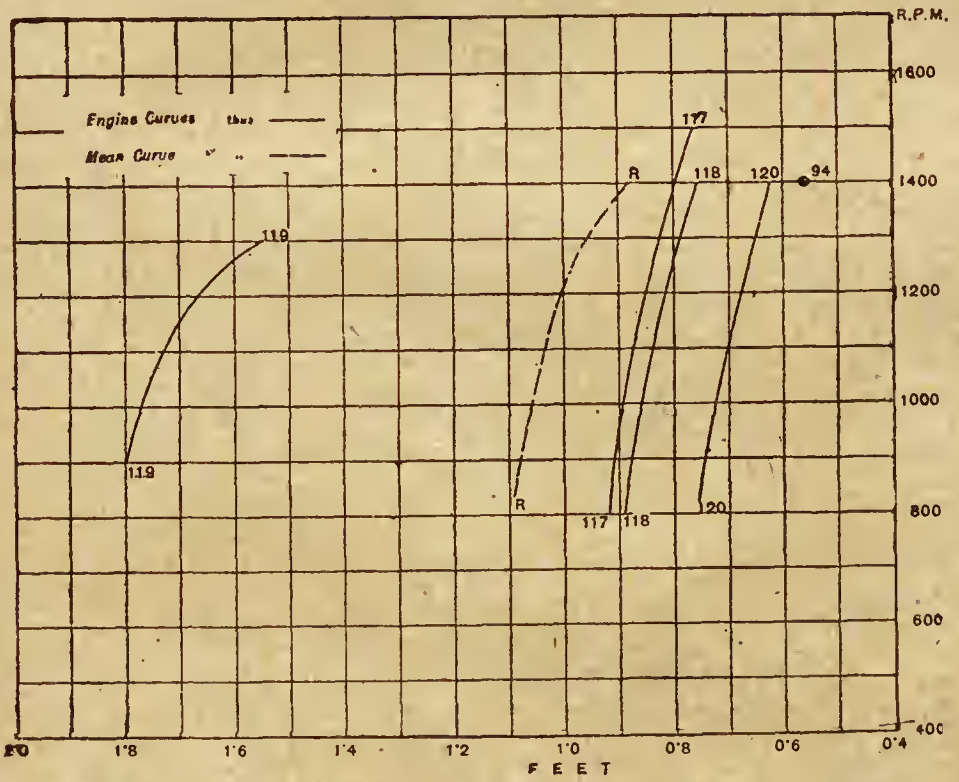


Fig. 3.—Equivalent radius; radial-type aero engines.

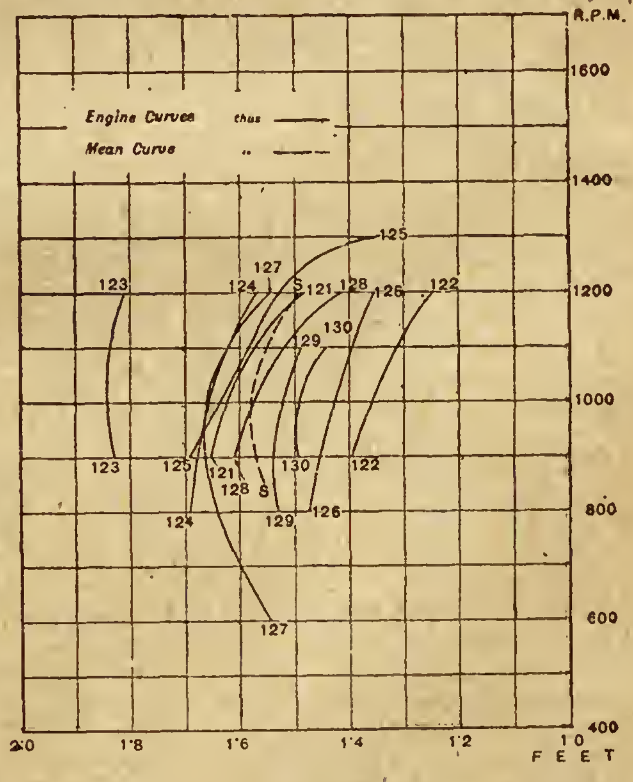


Fig. 4.—Equivalent radius; rotary-type aero engines.

"One fundamental conception, the study of which has contributed greatly to progress in automobile design, is torque. Most manufacturers plot the records of their engine tests as curves of brake horse-power, many also plot the torque curve, and others plot curves of fuel consumption. I have already expressed the opinion that the torque curve gives more information about the performance of an engine in a car than is apparent from the horse-power curve; moreover, it gives the data in the form in which they are actually wanted for all traction problems. In order to compare the torque curves of various engines of different dimensions, for heavy or light traction on land, for marine work and for aerial navigation, it is necessary to reduce all the torque curves to a common basis, and for this I have adopted torque per lb. of weight. Dimensionally, torque = ML^2/T^2 and weight = ML/T^2, hence torque per pound =

$$\frac{ML^2}{T^2} \Big/ \frac{ML}{T^2} = L,$$

that is a length which I will term the *effective radius* of the engine. If a gear wheel be supposed to be fitted to the crank-shaft of the engine and to engage with a vertical rack, the effective radius for the engine at any particular speed is the maximum pitch radius which this wheel can have to allow the engine to climb the rack.

"An example of a torque curve was given early in the proceedings, but no general comparison of torque curves appears to have been made up to the present. To remedy this deficiency I have made application to the best known engine and automobile manufacturers in this country, in allied countries and in America, as well as to other authorities, with the result that I have been enabled to obtain curves and data for 130 engines."

Mr. Legros then gave figures and graphs relating to various classes of engines, and we reproduce on next page those of the different types of motors for aircraft work.

"From the form in which the data have been supplied it has not been possible to fix a uniform basis throughout the comparison, but generally the weight of engines has been taken to include the magneto, the carburettor, the exhaust and inlet manifolds, the water pump and the water manifold, but dry or without water. Aero engines are either air cooled or water cooled; it is unsatisfactory to compare an air cooled engine with a water cooled engine dry—consequently, in the case of aero engines the weight of water, if any, is included, but usually there is no flywheel, consequently this latter, if any, is not included.

" Aeroplane engines may be divided roughly into four classes—vee, vertical, radial and rotary. The curves for these are shown in Figs. 1, 2, 3 and 4 respectively, and the mean curves, P, Q, R, S, are given together in Fig. 5, in which they can be compared with the mean curves of the other classes of engines drawn to the same scale.

Vee-Type Aero Engines.

No.	Cyls.	Bore.	Stroke.	Water. lb.	Engine, Dry. lb.	Total. lb.
93	8	90	120	—	375	375
96	12	100	140	—	625	625
97	12	100	140	—	625	625
98	8	105	140	—	450	450
99	8	100	140	—	450	450
100	8	120	130	140	416	556
101	12	*4·50*	*6·50*	250	871	1,121
102	12	92	135	212	745	957
103	8	120	160	140	688	828
104	12	90	150	180	940	1,120
105	12	92	139	192	750	942
106	12	110	164·5	290	1,000	1,290
Vertical-Type Aero Engines.						
95	4	140	146	25	329	354
107	6	142	175	175	592	767
108	6	142	178	145	597	742
109	6	140	160	160	595	755
110	6	140	160	150	595	745
111	6	130	175	132	538	670
112	6	130	175	132	538	670
113	6	140	152	103	597	700
114	6	*4·0*	*6·0*	75	380	455
115	4	140	146	25	329	354
116	6	81·5	155·5	90	535	625
Radial-Type Aero Engines.						
94	3	105	130	—	165·3	165·3
117	14	120	140	176	761	937
118	9	122	140	135	500	635
119	9	*5·0*	*6·0*	—	300	300
120	7	120	140	85	490	575
Rotary-Type Aero Engines.						
121	9	112	170	—	330	330
122	9	126	160	—	380	380
123	9	110	150	—	286	286
124	9	110	150	—	286	286
125	7	120	150	—	246	246
126	9	105	140	—	260	260
127	7	124	145	—	215	215
128	7	124	145	—	212	212
129	7	124	145	—	210	210
130	7	124	140	—	209	209

Dimensions in mm. are in roman type.
Dimensions in inches are in italic type.
Weights used in calculation are in heavy type.

" On these drawings there are three isolated points relating to early steps in the foundation of aviation ; these points are numbered as follows :—

" 93. The Renault 8-cylinder air cooled vee type engine (*k*) with which H. Farman made the first cross-country flight from Chalons-sur-Marne to Rheims, October 30th, 1908.

" 94. The Anzani 3-cylinder air cooled radial type engine (*l*) with which L. Blériot made the first cross-Channel flight, July 25th, 1909.

" 95. The Green 4-cylinder water cooled vertical type engine (*m*) with which S. F. Cody made the circuit of England in 1911.

" On the summary, Fig. 5, the tangent hyperbola to the mean racing car curve is drawn, and it is interesting to note how close to this curve lie the points 93, 94, and 95 ; the vertical engines have progressed since that day, but not so markedly as have the vee and radial types. It is very remarkable that the mean curves for both the last mentioned types have the same tangent hyperbola. But it is when we consider the rotary aeroplane engine that we realise to the full what progress has taken place in weight-saving in the short space of five years, for these engines have a mean effective radius some 50 per cent. greater than that shown by the mean curve for radial engines, and nearly double that shown for the vertical and for the vee types. Some of these types of engines, it is true, are fitted with a reduction gear, but the tangent hyperbola which defines the limit so obtainable shows that at present they do not average more than 70 per cent. of the corresponding effective radius of the rotary type."

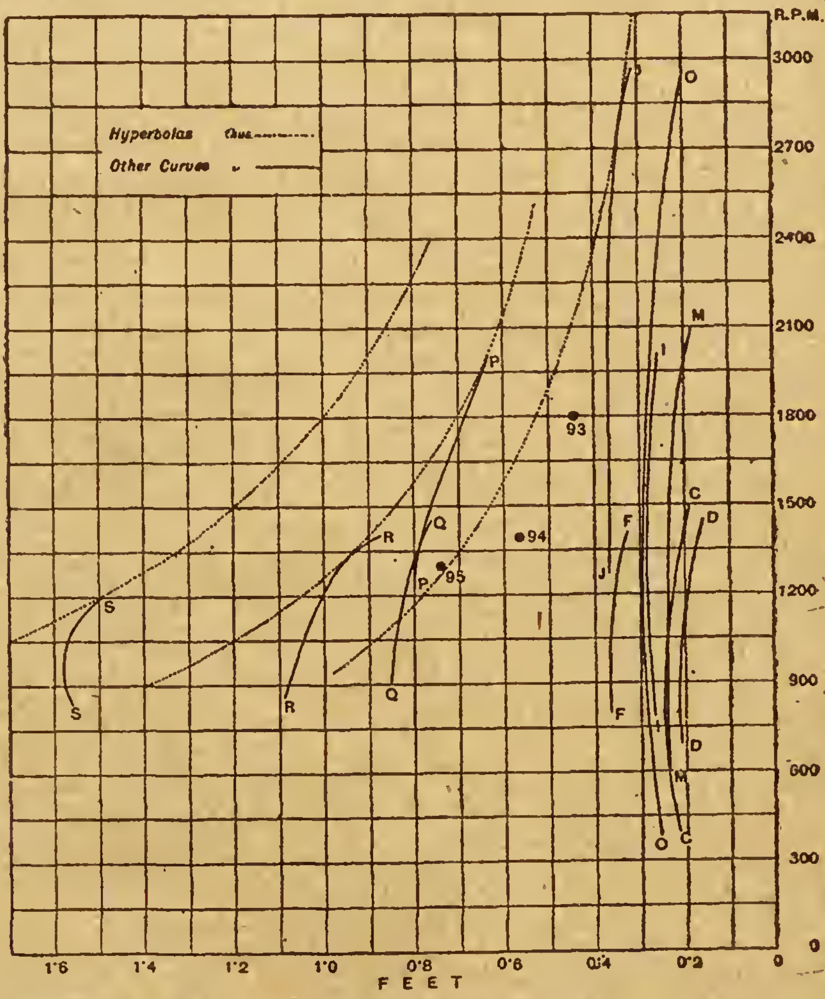


Fig. 5.—Mean equivalent radius ; curves compared. References : C, commercial vehicles, 1913–16 ; D, public service vehicles ; F, engine builders, 1911–16 ; I, 4-cyl. passenger cars, 1913–16 ; J, 4-cyl. racing cars, 1911–16 ; M, 6-cyl. passenger cars, 1913–16 ; O, 12-cyl. passenger cars, 1914–17 ; 93, Renault : cross-country flight, 1908 ; 94, Anzani : cross-Channel flight, 1909 ; 95, Green : circuit of England, 1911 ; P, vee-type aero engines ; Q, vertical-type aero engines ; R, radial-type aero engines ; S, rotary-type aero engines.

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The Aeronautical Institute and its " Supporters."

LORD MONTAGU of Beaulieu is desirous of having it known that the " Institute " is not authorised to use his name in connection with their affairs for any purpose whatsoever. Lord Montagu has previously written withdrawing his name, but he understands it is still being used by the " Institute."

German Aviators Interned.

A GERMAN aviator who dropped bombs on Belfort on the afternoon of October 13th was forced to land, owing to lack of petrol, at Soleure, Switzerland, and has been interned.

According to the *Maasbode*, a German aeroplane landed near St. Kruis, in Holland, last week, and the occupants have been interned. The *Echo Belge* also reports that a German aeroplane crashed near Wavre, but nothing is said as to the pilot.

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Lights on Air Raid Nights.

A FINE of 19 guineas was imposed on Brigadier-General Charles Stewart Prichard, C.B., D.S.O., of Ruston House, Patrington, at an Eastern County Petty Sessions on October 13th for an unshaded light on an air-raid night.

At the same court a farm servant was fined 2 guineas and 10s. costs for striking a match on an air-raid night.

Some other cases of match-striking are referred to in a leader on page 896.

The Zeppelin " L 33."

IT has been announced that the Zeppelin " L33," which came down near the Essex Coast, was 680 ft. long and had four gondolas, one containing three 6-cylinder 240 h.p. engines, while each of the three other gondolas contained a similar engine ; there were five propellers. She was fitted with 60 bomb-droppers, five machine guns and two light quick-firers.

AVIATION IN PARLIAMENT.

In the House of Commons on October 12th, in the debate on the Vote of Credit, Mr. Lynch said: I will proceed to another aspect of the question, that is the matter of aeroplanes. Some of us in this House from the very beginning of the war began to agitate for a great aeroplane fleet. Members of the Government, in their usual style of superior knowledge, pooh-poohed that idea as something impossible, and then, after a very long period, they adopted the expedient of forming a Board. We want an aeroplane fleet which will give us a mastery of the air, which will be the cavalry of the air, which will be one of the decisive factors in winning this war; the Government has given us a Board—a Board devised after a style more or less familiar of doubtful joint stock companies in the City which begin by giving a front-window dressing of well-known names.

The representative of that Board in the Commons is, I believe, a man of good intentions. He has done that extraordinary thing for a member of the Government, he has actively looked into the matter himself, and has endeavoured at some personal fatigue and peril to himself to be as efficient as possible. All that is to his credit; but, after all, he is not the director of the work of this Board; and, judging entirely by results, I would say that that Board has been a lamentable failure. The Board has not given us what we have a right to demand, that aeroplane fleet which once for all will show a superiority over the Germans, so that no German aeroplane can ever dare to show itself above the horizon. What I say is a possibility. Had the matter been accepted from the very beginning in the spirit in which some of us brought it forward, had true energy been put into the work, had we less of the Gambetta spirit and more of the spirit of Lazare Carnot, the organiser of victory, we should have had to-day, not a Board of high-sounding names and practical incompetence, but an aeroplane fleet. What was the dream of some of us could now be the reality of all. What is wanted is not merely a sufficient number of aeroplanes to tackle the Germans and gain a sort of predominance over them, or to be an aid in scouting or in directing artillery fire, or anything of that sort, but a wider conception of the functions of aeroplanes, which should be also an entirely separate arm. If I were to proceed to figures I would reach a number which would be far beyond anything that has yet been suggested. I would say, that it would have been possible, had this matter been tackled in a right spirit, with adequate intelligence and energy, to have at the present time a fleet of 30,000 aeroplanes. It would not have been used for these sporadic raids, which looked well in the *Daily Mail* and the *Daily Chronicle*, and so on, and which come in so very *a propos* when it is necessary for Ministers to come to this House to ask for £300,000,000; but for raids which would accomplish something definite and decisive towards the rapid winning of the war. With a fleet of that kind it would be possible to have not a mere raid on Combles or Strasburg or what not, but a continuous raid on points properly selected as part of a great plan which would, one by one, reduce these strong places to impotence so that the plan could be carried out methodically on to the next point. A fleet of that kind would be an aid to the Army in its attacks, and would finally attack the great German Army even in open campaign. It would be the cavalry of the air.

There is a possibility that the war may still last three or four years, and even now that possibility should be faced and this fleet be made a reality.

After predicting the course of the war ending with an armistice and leaving the Germans in possession of a considerable part of their conquest, and in a position to prepare for the future, Mr. Lynch said it would leave the great problem unsolved, and for other generations a still more terrible war than this one, which has been so unexampled in the history of the world. "I will not further elaborate the matter, but I will sit down after concentrating on that one point, the one great line of safety and power which can change the aspect of the war and give hope of a victory on the Western Front: that victory can only be obtained now by one means—that is, by realising the conception, bolder, as I have said, than anything yet contemplated, of a great and overwhelming aeroplane fleet, which will leave this country and the Allies undisputed masters of the air."

Mr. Billing, in the course of a speech, said The Press of this country seems to devote itself every day to new theories of why Germany must lose, because she has done something. I very rarely read that we must win because we have done something. The Tank itself was advocated when I happened to be at the Admiralty. I think I was one at the Admiralty who was interested in the new Tank propaganda. That was in December, 1914. When at the outbreak of war one of the men who to a very great extent brought the idea came over from America—an Englishman—he was turned aside, and no heed was taken of some of his best ideas. I threw out the simple suggestion in the early days that if we were going to employ these Tanks surely we should employ them with electric cables, so that when they broke down or got beyond the enemy's trenches they could be hauled back out of trouble, instead of being left with all their secrets in the enemy's hands. These Tanks which are so secret that we must not publish a photograph of them, or know whether they are made out of steel or of sugar candy, that we must not be told anything about them—I suggest that the Germans have already captured several of them. I ask the Secretary of State to contradict that, because I have heard it stated that we have lost some of these Tanks. If they are in the hands of the Germans, what is the use of keeping up this secrecy, this absolute official bunkum, which is exhausting the patience of the country?

This Cuffley airship business is another instance. Everybody who knows anything about airships is laughing over the stupendous and crass bluff that we are trying to make over that. We all know that that was not a Zeppelin. We all know that it was an old-fashioned army airship belonging to the Huns, and that this was the first and last time that they had the audacity to send one of that type over here. There we give the lie to the public, an official lie, and say we have brought down a Zeppelin. Even if it were true it would be fatuous enough. When we do bring down a Zeppelin there is no reason to make all this song about it. The fact that Zeppelins can get back after they have raided this country, after two and a-half years of war, the fact that one only is brought down out of ten, is a far greater disgrace to us than the fact that we have brought one down is a credit to us.

I want to tell the hon. member before I sit down that he has the material—I do not say he has an army—" the cavalry of the air " to which the hon. member on my right referred. There is no excuse at all in my opinion why we should not have a fleet.

There is no reason why naval aeroplanes to-day should not undertake the defence of the country without interfering with the little part they are playing in the war. There are the men and the machines, and everything else. You could then leave the Royal Flying Squadrons to get on with the war in France. Perhaps the hon. gentleman will tell us just exactly where the influence of the Air Board starts and where it finishes: where comes in its advisory capacity, and whether it is allowed to dictate. If the Air Board is purely in existence in an advisory capacity, you can take it from me that its advice is not worth anything. If it can dictate there is so much good work to be done. What I should like to say by way of suggestion to the Air Board is to discover to what extent they can dictate. I am afraid it is purely there as a name and not as a real thing. Under these circumstances I appeal to His Majesty's Government to put the control of the future Air Service in the hands of young men of imagination, and let them not only win their spurs but let them win for the country, through the squadrons of the air, in perhaps the year or two of war which we will yet have to face, what no other weapon that has ever been put into our hands can accomplish.

Major Baird (representing the Air Board): I do not believe that the House will wish to be detained very long on the subject of the air. Deeds count more than words in matters of war, and I do not think anybody who has followed the deeds of our airmen either at home or at the Front will have cause to complain in the manner in which the hon. gentleman who has just spoken has complained. The hon. gentleman who first raised the question advocated the creation of a vast fleet of aircraft. I can assure him that I entirely agree with him in that. I do not believe we could have too many aircraft. At least it is impossible to conceive conditions which would enable us to obtain more than we could use with very great success. But I must ask him to believe that both the Naval Service and the Royal Flying Corps are doing their very utmost to obtain aircraft, and that when he considers the small beginnings with which we started the war, the fact that the expansion of the Air Service has been able to keep pace with the astounding expansion of the Army, and at the same time to win and retain the supremacy of the air, which is undeniable, at the Front, disposes, I think, of the suggestion that there has been a slackness in the matter of developing the construction of aeroplanes. Doubtless the hon. member is aware of the enormous wastage which occurs in the conditions of active service. It is something appalling, and to make good that wastage, to keep up-to-date in the matter of new inventions and improvements, to supply the great expansion which is required—all that has entailed an immense amount of forethought and hard labour on the part of the officers who, long before the Air Board had anything to do with the business, had been in charge of the thing. I think their achievement reflects very, very great credit upon them, and the hon. member perhaps forgot that when he delivered strictures which we in this House are quite ready to accept, but which I do not think he applied to the officers, who cannot answer for themselves, and whose work has been too splendid for words.

I think it is necessary to remember also that aeroplanes and aircraft of all kinds are, perhaps, one of the most complicated and one of the most difficult forms of munitions of war to produce, and that to keep up quantities and numbers, and at the same time to produce the new types which are necessary in order to retain the mastery of the air, is a colossal work. I do not think the experts of our Air Service deserve blame. Indeed, they deserve very great praise for the manner in which they have carried out this work.

With regard to the hon. member for Hertford (Mr. Billing), I really wonder if there is anything to please him at all. Apparently there is nothing with which he is satisfied. Really, I cannot understand his frame of mind. With regard to his statement that there was no excuse for Zeppelins getting back to their country, does he honestly think that that is the proper way to describe or to refer to the deeds of those gallant airmen who go up night after night to destroy Zeppelins? How many has he destroyed himself?

Mr. Billing: Is that a question to ask? I consider it perfectly extraordinary, under all the circumstances of the material assistance given, that they have done such astounding deeds of heroism and efficiency.

Major Baird: I am very glad to have that admission from the hon. member, because what has been done, without in the slightest degree weakening our position at the Front, does seem to me to be deserving of a rather different statement from that to which we have listened to-night. The hon. member talks of handing over the air defence of the country to the naval airmen. Why the very name "Naval Air Service" shows that it exists for naval purposes.

Mr. Billing: For the defence of the country, like the Navy; for protection from invasion.

Major Baird: The Navy does not defend the country on land, but on the sea, and it is to assist the Navy in protecting the country on the sea that the Naval Air Service is detailed, and it seems a very logical attitude to adopt. At any rate, it was the attitude adopted some time ago. It is true the Naval Air Service at the beginning did undertake the air defence of the country, but that was because the whole of the resources of the Royal Flying Corps were required to fulfil the duties of the Army in the field. Now that the position has altered, the Royal Flying Corps has been able to take over and carry out, as I think most people who consider the matter will admit with extraordinary gallantry and efficiency, the very difficult and dangerous duties of safeguarding this country against Zeppelins. I do not contend, and it would be ridiculous to do so, that it is only the Flying Corps upon whom we have to rely for defence against Zeppelins. Anti-aircraft guns, searchlights, and aeroplanes are all combined in a carefully thought out plan, and that plan, as I said before the Recess, is by no means complete. It is improving every day, and if we adopted the attitude that that plan should be completed at a rate which would make it indispensable to deprive our forces at the Front of the support they require, both in anti-aircraft guns and aeroplanes, I do not think that is the view which would commend itself to any but a very small minority of people in the country.

Mr. Billing: I suggest you should take up your Army aeroplanes for employment in France and employ naval aeroplanes, which are doing nothing in England, for the defence of the country.

Major Baird: It is very easy for somebody who has no inside knowledge of the organisation of the Army Service to suggest that the whole thing could be upset and altered, but I think the House would believe that these matters are carefully considered by those who are responsible, and they are at least as anxious as the hon. member for East Herts that the defences of the country should be efficient, and if those defences were really as simple as the hon. member suggests we should be given credit for carrying them out.

Mr. Anderson: I do not propose to pursue the controversy to which we have just listened, but I am bound to say that I think a part of the speech of the hon. member for East Herts sounded to me very extraordinary, and the hon. member seems to regard it almost in the light of a personal grievance that a Zeppelin should be brought down.

The Cuffley Raider.

Mr. Billing, in the House of Commons on October 17th, asked whether the Secretary for War was prepared to make a statement as to the type of airship brought down at Cuffley.

Major Baird (on behalf of the Air Board) said he could only reply in the negative.

Mr. Billing: Is the hon. gentleman prepared to repeat on the floor of this House the official statement that the airship in question was a Zeppelin?

Major Baird: I can add nothing to the answer I have given.

Monetary Rewards to Airmen.

Mr. Billing asked the Secretary for War whether his attention had been called to the monetary rewards now offered by civilians to soldiers or sailors for the fulfilment of their duties; whether he was aware that, on the occasion of the first Zeppelin being brought down by an airman, the First Lord of the Admiralty refused to allow Flight-Sub-Lieut. Warneford to accept the monetary rewards offered; and whether the War Office and the Admiralty viewed the dignity of the Services from a different standpoint?

Mr. Lloyd George said, so far as the question relating to naval officers was concerned, it should be addressed to the First Lord of the Admiralty. The answer to the first part of the question was in the affirmative. As to the last part, a regulation by which the Army Council were empowered to forbid an officer to accept a gift was about to be issued.

Mr. Billing further asked whether, in view of the exceptional individual heroism necessary and peculiar to the duties of an airman on active service, more especially in engaging a Zeppelin in darkness, the right hon. gentleman would advise His Majesty to create a special distinction for airmen.

Mr. Lloyd George replied that the awards open to officers and men of the Army were considered to be adequate for services of any nature.

Tracer Bullets.

Colonel Norton Griffiths asked the Secretary for War whether certain of our airmen had been captured with Tracer bullets used for range-finding with machine guns in their possession, and in consequence were awaiting Court-martial and were in imminent danger of being sentenced to death; whether Tracer bullets have been found on Zeppelin raiders captured in this country; and, if so, whether he would see that the same penalties were imposed upon them as were imposed upon our airmen by the enemy.

Mr. Lloyd George: It is probable that some officers or men of the Royal Flying Corps who have been captured have had Tracer bullets used for range-finding in their aeroplanes. Cartridges with explosive bullets were found in one of the German airships which were brought down in this country. The Army Council have no official information as to any Courts-martial of prisoners of the Royal Flying Corps.

Insurance Against Air Raid Damage.

Sir Edwin Cornwall asked the Prime Minister whether the Government has reconsidered the question of the losses sustained by private individuals through Zeppelin attacks in this country; and whether the Government is now prepared to accept the principle of national liability?

The Prime Minister: It is not proposed to make any alteration in the system whereby provision for such losses can be made by means of insurance under the Government scheme.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), October 10th, 9 p.m.

"An enemy aeroplane was brought down north of Neuville St. Vaast. Yesterday our own aircraft were again very active. One of our machines is missing."

General Headquarters, October 11th, 10.25 p.m.

"Air guns also dealt effectively with bodies of hostile infantry assembling in the rear of the enemy lines.

"Yesterday our aeroplanes destroyed by bombing two enemy battery positions and damaged many others. They penetrated well behind the enemy front and bombed railway stations, trains, and billets with good effect.

"There was much fighting in the air, and in one case two of our machines engaged seven hostile aerolpanes and drove down or dispersed them all. One of these enemy machines was seen to be destroyed and two others severely damaged. Four of our own machines are missing."

General Headquarters, October 12th, 10.22 p.m.

"Though the weather was unfavourable for aircraft, there has been much bombing activity during the past two days by our aeroplanes against the enemy's lines of communications, aerodromes, and infantry on the march. One of our machines has not returned."

War Office, October 13th.

"*Mesopotamia. Tigris Line.*—On the 10th inst. our aeroplanes bombarded a hostile camp at Gussabs Fort (11 miles S.E. of the Dujailah Redoubt) with good effect. On the following morning it was observed that the camp had disappeared."

Admiralty, October 14th.

"A successful raid was carried out on Oberndorf on the afternoon of October 12th by a large number of French and English naval aeroplanes. Three English machines failed to return."

General Headquarters, October 16th, 9.59 p.m.

"Much successful work was carried out by our aeroplanes yesterday in conjunction with our artillery. One hostile battery position was completely destroyed and many others severely damaged. Bombs were dropped on an enemy railway station and upon transports moving behind the enemy's lines with excellent effect."

War Office, October 16th.

"*Salonica.*—A successful bombing attack on Buk Bridge was carried out by the Royal Naval Air Service."

French. *Paris, October 10th.*

"Our aeroplanes have shown themselves particularly active in the region of Remiremont and the Somme. They fought six air fights, bombed the Saint Pierre Vaast Wood, and effected numerous reconnaissances.

"During the night of October 9th-10th Adjutant Pilot Baron and Adjutant Chazard bombarded at Stuttgart the Bosch magneto factory. Dense smoke was seen rising from this factory as the result of the bombardment."

"*Balkans.*—Monastir and Prilep were bombarded by our aeroplanes."

Paris, October 11th.

"Yesterday bombs were dropped by enemy aeroplanes on Gerardmer and Belfort. The damage was insignificant. Five shells were dropped without any effect in the direction of that town by the enemy's long-range artillery.

"In the course of yesterday, besides numerous surveillance, reconnaissance, and range-regulating flights, our aeroplanes fought 15 engagements in the Verdun region, 14 south of the Somme, and 44 north of that river. In the course of the latter engagements four enemy machines were brought down, one by Adjutant Dorme, who thus reached his thirteenth machines brought down. Six other enemy machines were seriously hit and fell into the German lines.

"Bivouacs and cantonments in the vicinity of Peronne, and the Tergnier aviation sheds, the railway stations of Saint Quentin and Guiscard, and the wood of Porquéricourt were severely bombarded. A train running between Annois and Ham was attacked both with bombs and machine guns. During the night of the 10th-11th the Lorrach establishment (Grand Duchy of Baden), the Colmar aviation ground, and Mulheim railway station were bombarded."

Paris, October 12th.

"One of our air squadrons last night bombarded the railway station of Vigneulles, with results that were observable."

"*Balkans.*—Our aeroplanes bombarded Prilep and Philippopolis."

Paris, October 13th.

"A Franco-British squadron of 40 aeroplanes bombarded the Mauser works at Oberndorf (on the Neckar); 4,340 kilogrammes (over 4 tons) weight of projectiles were dropped, and their attainment of the objectives aimed at was noted. Six German aeroplanes were brought down in the course of fights into which they entered to defend their factories."

Paris, October 14th.

"Our aeroplanes bombarded Vouziers and Ardeuil. Fog and clouds hampered air operations along the whole of the front."

Paris, October 15th.

"In spite of the clouds 300 metres from the ground and a veritable and continuous barrage of fire between 200 and 300 metres, our aeroplanes co-operated in the most effective manner in the fighting yesterday south of the Somme. They surpassed all that could be expected of them. One of our machines returned riddled with over 200 bullets. North of the Somme two pilots attacked the enemy with machine-guns at short range in his trenches, flying very low. In the course of the recent bombardment of the Mauser works at Oberndorf, Adjutant Lufbery, of the American Squadron, brought down his fifth enemy machine."

Paris, October 16th.

"In spite of the bad weather, our aeroplanes fought seven engagements, in the course of which one enemy machine was brought down.

"In the sector of Lassigny a German aeroplane which was hit by our artillery fell in flames in its own lines."

Russian. *Petrograd, October 13th.*

"In the region of Seletin (on the River Suchava), in the Wooded Carpathians, an enemy aeroplane was brought down by our rifle-fire. The machine caught fire as the result of the fall. The aviator and observer, who were alive, were taken prisoner."

Petrograd, October 16th.

"On Saturday, in the region of Prudy Railway Station, a German aeroplane, which was hit by our machine-gun fire, descended. The aviators were taken prisoners."

Italian. *Rome, October 10th.*

"Last night hostile aeroplanes made another raid on the Lower Isonzo, dropping a large number of bombs on villages in the Grado Lagoon and elsewhere; three people were killed, a few others wounded, and some damage done. One of our aeroplane squadrons dropped bombs on the enemy positions on Col Santo, north of Mount Pasubio. Our aviators drove off numerous aerial attacks and returned safely. On the night of Oct. 8th an enemy aeroplane flew over Valona dropping bombs, without, however, causing any damage."

Rome, October 12th.

"Hostile aircraft dropped bombs yesterday on the Asiago plateau without doing any damage.

"One of our squadrons again bombarded the enemy's positions on Col Santo (Adige Valley), returning safely to our lines."

Rome, October 13th.

"Enemy aircraft bombarded the Grado Lagoon and other points on the Lower Isonzo; there were a few casualties, and trifling damage was done. In an air fight above Gorizia a hostile aeroplane was driven down and fell near San Marco."

Rome, October 14th.

"Our aeroplanes dropped bombs on enemy hutments in the Sugana Valley and returned safely. In the evening enemy aircraft made the usual raid on the Lower Isonzo without doing and damage."

Roumanian. *Bucharest, October 11th.*

"During aerial attacks by enemy airmen bombs were dropped on Constanza and on the towns on the banks of the Danube."

Bucharest, October 12th.

"An enemy air squadron dropped bombs on Constanza, also poisoned sweets and garlic infected with cholera bacilli."

German. *Berlin, October 11th.*

"Our aviators brought down four aeroplanes behind the enemy lines, and four behind our own."

"*Balkans.*—Our aeroplane squadrons successfully bombarded troop transports near Constanza."

Berlin, October 14th.

"The raid by an enemy air squadron on Southern Germany, mentioned in to-day's *communiqué*, occurred, according to supplementary official reports, as follows: Yesterday (Thursday), between 3 and 5 in the afternoon, several enemy air squadrons, totalling from 40 to 50 machines, flew over our South German home region. Bombs were showered on Donaueschingen, Allenenshofen, Hüfingen, Eschweiler, near Neustadt, Hatsich, in the Kinzig valley, and Rottweil. They did no military damage. They damaged private property to a small extent and slightly wounded some civilians. At Tübingen a bomb fell on a reserve hospital, killing two children in a neighbouring garden. In itself and at Oberndorf seven persons were killed and a number wounded, the total casualties being 27. Of the attacking aeroplanes nine were brought down by our airmen and anti-aircraft guns, including one British aeroplane. The enemy in this fresh attack on peaceful German places had to pay for his results, which were without military importance, by suffering heavy losses himself."

Austrian. *Vienna, October 11th.*

"In the evening of the 10th inst., one of our aeroplane squadrons successfully bombarded the military object of Monfalcone and Staranzano. In the night of the 10th-11th inst. a hydroplane squadron attacked the harbour establishments, the airsheds, and the batteries of Vlora as well as the enemy ships lying there, with the best results. Big fires in the town, which remained visible for a long time, and the burning of an oil tank were observed. All our machines returned undamaged."

Bulgarian. *Sofia, October 4th.*

"Our seaplanes attacked with great success an enemy seaplane shed on Tachawlu Lake, north of Constantza."

Sofia, October 6th.

"On the Black Sea coast our seaplanes attacked an enemy war vessel off Mangalia, and forced it by dropping bombs to beat a hasty retreat."

Sofia, October 13th.

"On the Black Sea coast a seaplane squadron attacked the port of Constantza on Tuesday last, causing great fires in the harbour and in the oil tanks."

Personals

Casualties.

Captain Ralph Newton Adams, M.C., Royal Fusiliers and R.F.C., reported killed, was the only son of Mr. and Mrs. H. N. Adams, of 8, Stanley Crescent, W. Born in 1895, he was educated at St. Andrew's, Eastbourne, and Charterhouse. In May, 1914, he was gazetted to the 7th Royal Fusiliers and proceeded to the Front, attached to the 4th Battalion in December, 1914. He was invalided home in February, 1915, and in August, 1915, was gazetted to the R.F.C. He returned to the Front in March last, and was awarded the Military Cross and made Flight-Commander in July. He was killed on October 10th.

Second Lieutenant John Sinclair Morison, R.F.C., killed whilst flying on October 13th, was the eldest son of Mr. and Mrs. John Morison, Talbot Road, Highgate, and a nephew of Sir Maitland Park, editor of the *Cape Times*. He was born at Woodford Green, Essex, in November, 1896, and was educated at Christ's College, Finchley, whence he matriculated in 1913. He enlisted at the outbreak of the war, and in July, 1915, transferred to the Inns of Court O.T.C. In June, 1916, he volunteered for service in the R.F.C. Whilst flying on October 13th his machine nose-dived, and he was killed instantaneously. His younger brother is in the Service.

Lieutenant Alfred Henry Templeman Loraine Speer, R.F.A., attached R.F.C., previously reported missing, now known to have been killed on July 9th last, aged 22 years, was the elder son of Dr. and Mrs. Speer, of The Priory, Great Malvern, and Powyscourt, Balcombe, Sussex. He was educated at Malvern College, where he was in the O.T.C., afterwards proceeding to Trinity College, Cambridge. On the outbreak of war he joined the Public Schools Brigade, and later obtained a commission in the R.F.A., in which he subsequently received promotion. In 1915 he trained for the R.F.C., becoming attached in January of this year. He was on active service from March until July 9th, when he met his death in combat in the air over the enemy lines, his machine being shot down, and he and his observer killed.

Second Lieutenant J. S. Mitchell, R.F.C., aged 20, who has died on active service, was the only son of Colonel and Mrs. T. W. H. Mitchell, of Sandygate, Wath-on-Dearne. He was educated at Rugby, and was intending to take up the profession of a mining engineer. After leaving school in July, 1914, he went for a tour in Australia and Canada, returning in July, 1915. Then he commenced to work on munitions at Sheffield, and continued to do so until he was gazetted to the R.F.C. on June 3rd, 1916.

Missing.

Lieutenant W. Douglas Miller, R.F.C., elder son of the Rev. Hugh Miller, Shandon, Dumbartonshire, is officially reported missing from October 2nd. Lieutenant Miller, who is 23 years of age, went to the Front some weeks ago.

Lieutenant Lionel Pinkerton, R.F.C., previously officially reported missing, is, it has now been ascertained, a prisoner of war in Germany. He is a nephew of Mr. Wm. Pinkerton, Dunaverney, Ballymoney, and has a brother, Norman, serving with the Australians.

Second Lieutenant Henry A. Taylor, M.C., Royal West Kent Regiment and R.F.C., elder son of Mr. and Mrs. F. H. Taylor, formerly of Lovelace Gardens, Surbiton, is reported missing. Lieutenant Taylor was in August awarded the Military Cross for bombing a train from a height of 450 ft., derailing several trucks, under heavy fire from enemy machine guns. He is 18 years of age.

Married and to be Married.

The marriage of Major Sandford Wynne Eyton, R.F.C., and Miss Frances Carbutt, will take place on Tuesday, October 24th, at 2.30, at St. John's, Southwick Crescent.

The marriage arranged between Mr. Sydney Pickles, son of Mr. M. P. Pickles, of Australia, and Miss A. R. E. Marks, daughter of Mr. Ritchie Marks, of Hampstead, N.W., is to take place on November 3rd next. It is to be an extremely quiet ceremony, and no invitations are being sent out.

A marriage has been arranged, and will take place in December, between Lieutenant Robert Peel Ross, R.N., Squadron Commander, R.N.A.S., only son of the Rev. R. Peel Ross and Mrs. Ross, of Druim, Inverness, and grandson of the late Captain Horatio Ross, of Rossie Castle, Montrose, and Muriel, youngest daughter of Mr. E. H. Kinnard and Mrs. Kinnard, of Clevelands, Westgate-on-Sea, Kent.

Items.

Second Lieutenant John Hampson Dodgshon, Surrey Yeomanry and R.F.C., of whom a biographical notice has appeared, was the son of Mrs. Herbert Hooper, of Wandsworth Common, S.W.

The will of Second Lieutenant William Jamieson McConnochie, R.F.C., killed in France November 8th, has been proved at £1,722.

Lieut. Wulstan Joseph Tempest, R.F.C., who has been appointed Companion to the D.S.O., is 25 years old. He is one of the younger sons of Mr. Wilfrid F. Tempest, of Ackworth Grange, Pontefract, Chairman of the West Riding Bench for the Pontefract Division. He was educated at Stonyhurst, where he won distinction in mathematics, and then spent three years on the training ship "Worcester." From that he took up mining engineering, subsequently spending two or three months sugar farming in South Africa. With his brother, Edmund, who is also in the R.F.C., he then went to Canada farming for three years, and came home in October, 1914. Securing a commission in the K.O.Y.L.I., he went to France in May, 1915. He was invalided home, and after serving in a garrison battalion was transferred to the R.F.C., obtaining his "wings" in June last.

SIDE-WINDS.

Up to but a short while back the use of aluminium and its alloys in connection with aircraft was, considering its apparent possibilities, somewhat limited, owing partially to prejudice against its use based on certain unfavourable characteristics of pure aluminium itself, and partially due to the fact that there were few aluminium alloys that did not present defects in one way or another. Now, however, aluminium is finding more favour with designers, and there are at present on the market several aluminium alloys that have given excellent results under varying conditions. One such alloy is "Miralite," the manufacturers of which have had nine years' experience in handling all kinds of work in aluminium and its alloys. "Miralite" is produced in 30 different grades, all of the same composition, to meet various requirements. We are informed that a tensile strength of 17 tons is obtainable with "Miralite," whilst its electrical conductivity is 59. After exhaustive comparative tests with various aluminium alloys, one of our foremost aero engine constructors finally adopted "Miralite" for the pistons with most satisfactory results in practice. The Miralite Co. make a speciality of die-cast and sheet work, and among the advantages claimed for this metal are its durability and immunity from the harmful action upon it by the atmosphere, salt water, &c. As an example of this claim it may be mentioned that a L. and S.W. Railway coach equipped throughout with "Miralite" fittings has been in use for the last six years, and the fittings are as good as new, whilst a proof that sea water has no harmful effect on it was demonstrated by towing a piece of this metal behind a boat from New Zealand to England without any sign of action resulting. The Miralite Co., of High Street, Mortlake, London, S.W., will be pleased to place their experience at the disposal of any firm contemplating the adoption of their alloy.

* * *

Propeller makers especially will be interested to hear that Messrs. C. Noel Legh and Co., who are paying particular attention to the needs of the aircraft industry as regards timber, are now handling a very fine parcel of 1-inch prime Honduras mahogany boards eminently suitable for propellers.

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Two new patterns of the well-known Lodge sparking plug for aero engines are being introduced by the Lodge Sparking Plug Co., Ltd., of Rugby. Illustrations of both are annexed—the one on the left being model "R" for rotary engines, which is priced at 10*s.* 6*d.*; while the other, on the right, is for engines with stationary cylinders and is known as the "KS": it sells at 11*s.* 6*d.* At the same time it should be noted that the popular Lodge model "A" plug is now listed at 12*s.* 6*d.*

* * *

In connection with the fund for the benefit of M. Osipenko, who was able to pay a visit on crutches to Hendon the other day, a concert is being held at the Holborn Restaurant on Saturday, October 21st, at 9.30 p.m. Several well-known music-hall artistes have promised to appear, including Carr Lynn, Lupino Lane, Harry Weldon, Kisbey, &c. Tickets are 2*s.* 6*d.* and 5*s.* each, and can be obtained at the door or from Mrs. Savery at the Hendon Aerodrome Café, or at the Grahame-White Co.'s offices.

Mr. Virgilio, formerly instructor at the Beatty School of Flying at Hendon, has, we understand, joined the Wells Aviation Co. of Chelsea. He will probably be chiefly engaged down Chichester way at the new place being started down there by the firm.

* * *

The Barnwell Brothers apparently continue their friendly competition in the way of startling designs. F. S. holds, we believe, the honours for the moment, with a new surprise packet built by the Bristol firm. No details, of course, at present, but it is "some" 'bus. One may be sure that Harold has still another up his sleeve, and as it is his turn next, we may look for progress and still more progress.

* * *

Another stunner, this time hailing from away up North, is promising well. It is, as far as we know, the first machine of the type to be built in this country, so that more than ordinary interest attaches to its performance.

* * *

Mr. W. Chas. Holt is the moving spirit, general manager and secretary of the Canute Airplane Co., a company which is taking over the works of Moonbeams, Ltd., at Royal Pier Gates, Southampton. Under the guidance of Mr. Holt, who has been actively identified with aviation for a number of years, the comapny is to build seaplanes and land machines as well as fittings and aero engine parts.

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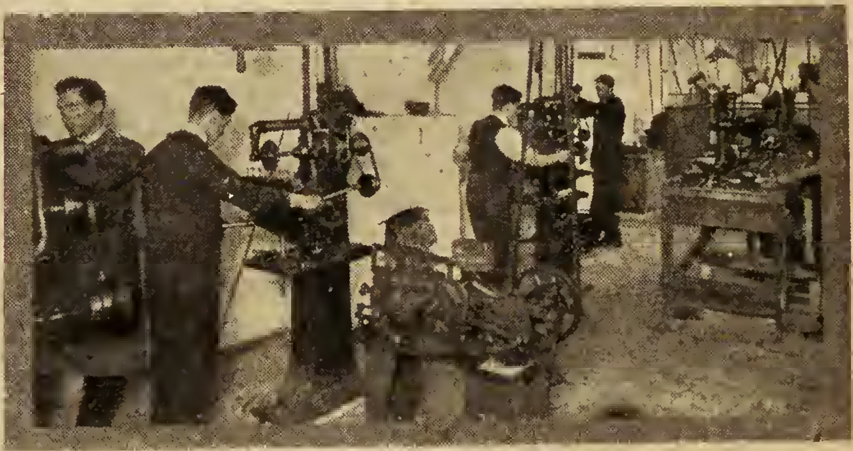
A.S.C. Expansion.

Ever since their inception just a year ago the Aircraft Supplies Co., of John Street, Theobald's Road, London, W.C., have made "exceeding good" in their by no means easy task of supplying the industry with fittings, more fittings, and still more fittings. The result is that the inevitable has happened—from factors they have now become manufacturers themselves. With the aid of a factory conveniently situated at the back of the firm's offices in John Street, standard fittings and those to special specifications will be turned out so as to meet requirements under much more favourable and speedier conditions than hitherto. A number of shops fitted with up-to-date machinery are already in operation, whilst there are ample facilities for further expansion as requirements demand.

Among the machine tools already at work are a No. 4 Herbert capstan lathe turning out duralumin pulleys; a number of ¾-in. capstan lathes making special eyebolts (AGS. 122) and shackle-pins; eight large and small milling machines machining wing tip skid sockets (No. 5790, Parts 3 and 4), shackles, elevator levers (Drawing 9807, Part 1), and other drop forgings; a Chicago automatic turning out 100-ton pins (AGS. 137), and No. 2 Foster capstans making duralumin washers (AGS. 157) and special hinge bolts. The tool room is well equipped and able to cope with the making of any tools required for the various machines.

The works naturally contains an adequate number of single and double-spindle drilling machines, screw-cutting lathes and similar auxiliary plant. The power is derived from 3 × 20 h.p. electric motors.

Portions of the shops are reserved for additional machinery which is expected to be installed within the next few weeks, and these include several automatics, screw-cutting and



A portion of the main machine shop in the Aircraft Supplies Co.'s new works, showing lathes working on eyebolts and shackle-pins, and also some milling machines operating on elevator levers, shackles, &c.

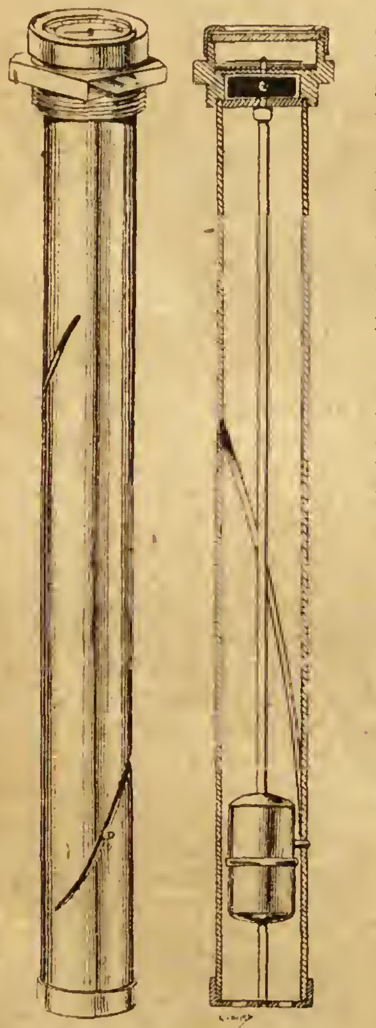
capstan lathes, including an additional No. 4 Herbert. A new shop is being provided for fitters and welders, and for the installation of a plant for suaging rods and drawing stream-line wires, and for the accommodation of a number of power presses. A shop for the manufacture of wood parts will also be added in the near future.

We have already drawn attention to the illustrated list issued by the A.S.C. every fortnight, but mention may be made of another feature the company proposes to introduce, which should be of great assistance to constructors. It is proposed to issue a booklet containing reproductions of all the more important AGS. blue print specifications, supplemented by photographs of the various parts.

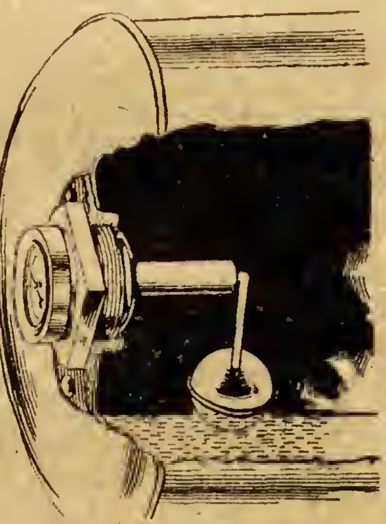
Mr. George H. Mansfield is certainly to be congratulated on the progress of the A.S.C., and with such confrères as Mr. Bernard Isaac as co-director, and Mr. G. W. Smith as works' manager, still further success may be anticipated.

The Simms Petrol Gauges.

One thing which worries the pilot not a little is as to how much petrol remains in the tank. Many devices have been invented and put on the market, but generally speaking they have been either too complicated or they have failed on the score of reliability. An exception, however, is the Simms petrol gauge, which is finding increasing favour and is becoming almost a standard fitting in some directions. The Simms gauge, which is sold by The Simms Motor Units, Ltd., 191, Wardour Street, is made in two patterns, but the principle is essentially the same in each case. In the original vertical form there is a float which can rise and fall on a gunmetal ribbon, but as it goes up or down a pin on the side travels through a cut in the casing and so twists the ribbon. At the top of the ribbon is a small bar magnet which controls the pointer on the other side of the dial and so indicates the amount of petrol in the tank. In the other pattern, which is mostly favoured for aircraft work, and is fitted either at the side or end of the tank, the float is fixed at the end of a wire, which is bent at an angle, and as it travels up and down it moves the magnet which controls the pointer as in the other case.



The Simms Petrol Gauge.—Vertical type, with the dial at top of tank. In the sectional view the float is seen on the gunmetal ribbon which moves the bar magnet at the top.



The Simms Petrol Gauge.—The horizontal model for fitting at side or end of tank.

One important feature common to both types is that there is no place for petrol to leak through so that the gauge is fume-, dust-, moisture- and air-tight. The fitting of the gauge is a simple matter; a flange bushing is soldered directly on to the tank and the gauge is screwed in, making a perfect joint, while, should it be necessary at any time to remove the gauge, a screw cap, which can be supplied, is inserted in its place.

AEROLITE PISTONS.—A batch of pistons of various sizes, in the rough and finished, made by the Aerolite Piston Co., Ltd., of Hanover Court Garage, Hanover Street, London, W., of their special aluminium alloy.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

Landing practice last week with Instructor: Messrs. Kaizer, Payne, Steeves, Green, Woods, Robertson, Travers, and Sutherland. Straights with Instructor: Messrs. Randon, Hitchcock, Norris, and Whiteman.

Instructors: Messrs Manton, Winter, Pashley, Biard, and Hale.

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PUBLICATIONS RECEIVED.

Eclipse or Empire? By H. B. Gray and Samuel Turner. London: Nisbet and Co., Ltd., 22, Berners Street, W. Price 2s. net.

"Hunlikely." By W. Heath Robinson. London: Duckworth and Co., 3, Henrietta Street, W.C.

Some "Frightful" War Pictures. By W. Heath Robinson. London: Duckworth and Co., 3, Henrietta Street, W.C. Price 1s. net.

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NEW COMPANIES REGISTERED.

AERO-MECHANICAL, CO., LTD.—Capital £3,000, in £1 shares (1,000 7½ per cent. cumulative preference). Acquiring business of Edgar Salomon and Jacques Fogelson, carried on at 63–66, Rochester Row, Westminster, as the Aero-Mechanical Co., importers, exporters and repairers of and dealers in aeroplanes of all kinds. First directors: B. Bonas and A. Bonas.

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Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

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As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

"L. 33."

BY the courtesy of the Naval and Military authorities we are enabled this week to publish a very complete series of photographs and descriptive articles dealing with the Zeppelin airship "L. 33," which was brought down somewhere in Essex on the night of 24th September. The photographs—which were taken by our own photographic staff—form a complete record of the essential parts of the wrecked airship, and are of surpassing interest in view of the halo of mystery which has hitherto surrounded the construction of the latest of the "super-Zeppelins," and we may thus with some amount of justice claim for the present issue of FLIGHT a more than ordinarily historical interest.

In no case of the destruction of one of these craft during the present war has the wreckage retained so well the original lines of the structure as in the case of the "L. 33," nor has one been brought down in so favourable a situation for the eye to take in the immensity of these air-strafers. And, we think, our pictures, supplemented by the letterpress, make the most of the circumstances. That, however, is for our readers to judge.

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Trade After the War.

The President of the Board of Trade has appointed a committee to consider the position after the war, especially in relation to international competition, of the lead, copper, tin and such other of the non-ferrous metal trades as may be referred to the committee, and to report what measures, if any, are necessary or desirable in order to safeguard that position. The composition of the committee is one that must meet with thorough approval, since it is lacking altogether in the official element, every single one of its members being closely identified with one or other of the trades concerned. Initially, this is just as it should be, inasmuch as such a committee should be able to carry on its investigations and discussions, and to make its report, free from the deterrent influence of officialism and politics. So far, so good, but we always have to keep in mind the fact that no matter how carefully a committee may investigate and report, the last word lies with the official departments. Therefore, while we are in the most perfect accord with the principle of appointing these investigating committees, it will not do to delude ourselves into the belief that that is all that is necessary to ensure our trade position after the war. Be the recommendations of these committees never so sound, we may well find that they conflict in some way with, let us say for the sake of example, the tariff views of the dominant party in the Government, and are thus foredoomed to be indefinitely pigeon-holed, and in the meantime the appointment of the committees has been the means of the thinking public being kept quiet for the time. It will in no wise do for the business interests of the country to rest content with the appointment of departmental committees. These are all very well in their way, and may doubtless be relied upon to collect and collate a large amount of useful data as a guide to our commercial policy after the war. That is not enough, however. The British manufacturer and trader will have to help himself in addition. He will have to organise in order, for one thing, to compel the Government to give effect to the considered recommendations of such a committee as that which forms the present basis for discussion. He will have to organise to take advantage of the new situation created by the carrying into effect of any such recommendations as those implied, and in this connection we would draw the attention of our readers to a letter, *à propos* this same aspect of the case, which we print in our correspondence columns. Our correspondent very rightly says that we shall probably find that British trades and industries will progress and flourish just in proportion as they concentrate their energies now upon perfecting their organisations and co-operating in a commercial campaign conducted in every corner of the world. It is of no avail to practise the policy of wait and see what the Government is going to do to further British trade interests. The thing to be done is to go out and capture the trade first, and then bring the necessary pressure to bear on the Government to ensure that we are given a fair field in the world's markets—not to await the achievement of the fair field before beginning on the campaign. That way will lie disaster. And, be it said, it is not the way the Germans are going to work. We know that when peace comes the Germans will have to begin over again with all the handicap they have created for themselves by their methods of frightfulness, plus any additional disabilities that may be imposed by the Allied nations in the way of restrictions on international commerce. But we know they are not sitting down to wait and see what those disabilities are going to be before making their preparations to meet and defeat them. On the contrary, all the news that filters through indicates that they are preparing for the commercial and shipping war with the same careful elaboration that characterised their preparations for military war. It is for the British industrial community to see that it is not a case of the six divisions over again.

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A New Development of War. In the reports of the recent fighting on the Somme front, the official French reports have made mention for the first time of aviators actually taking part in the infantry attacks. Apparently these aviators precede each attacking wave of infantry by a few yards, flying extraordinarily low—sometimes at no more than 300 feet—dropping bombs on the enemy trenches and signalling back to the advancing infantry.

This is a development which at first sight would lead to the supposition that the casualties among the aviators detailed for this duty must be relatively enormous. On the contrary, however, the reports assure us that they are extraordinarily light.

To the one versed in the lessons of practical war, there is really nothing surprising in this. The psychology of the fighting man is a peculiar thing, and nothing produces so much effect as the unexpected or that which is imperfectly understood. It is one thing to contemplate in cold blood the anticipation of some new method of attack, but too often quite another to meet it when it comes. Theoretically, it should be the easiest thing in the world to bring down aviators flying low over trenches, and so indeed it would be in practice, but for the distraction caused by attack from in front and from overhead at the same time. The safety of the attacking airmen lies in the element of uncertainty of action this dual attack produces on the enemy. It is analogous to the case of the sportsman who puts up two birds, cannot make up his mind on the instant which to take first—and misses both when he does fire. It would require a much higher standard of fire discipline—as distinct from what may be called parade discipline—than is apparent in the German army of the Somme to deal effectively with both kinds of attack at once. The success of the new tactics lies, therefore, in the unexpected character of it and the demoralisation, for that is the true word to be applied to it, of its effect. Possibly the Hun will get used to it in time and learn how to deal with it. By then something else will have been devised to get his nerves on the raw edge. The present interest of the thing lies in the indication it affords of the extent to which our Allies and ourselves hold the mastery of the air and the contempt of the enemy felt by our respective air services. It seems the very apotheosis of the "personal ascendancy" upon which the *communiqués* insist.

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To Help British Trade. In connection with the announcement of the reorganisation of the Commercial Intelligence and Exhibition Branches of the Board of Trade, we have been favoured with a copy of a letter addressed to Mr. Runciman by Messrs. Benn Bros., who are the publishers of a number of trade journals. In this letter it is pointed out with perfect truth that the usefulness of both these Departments has in the past been seriously curtailed by the publication of the *Board of Trade Journal* and the setting up of Government copyright in Consular reports.

The letter goes on to say that there are in the country probably a thousand trade papers published; there are certainly some hundreds of well-established and powerful journals, many of them with large circulation. If instead of appearing to compete with these, the Board of Trade were to abolish its own publication and utilise the whole body of the trade Press, its work and activities would receive many times the publicity and interest which they now enjoy. If the effort which is now absorbed in the production of the *Journal* were devoted to a Press Department charged with the dissemination of Board of Trade news, the usefulness of the Board's efforts and the interest in its doings would be much increased.

The point that the *Journal* is in competition with the trade Press in several ways, and that the suggestion to abolish it savours of self-interest, is countered by the reply that the trade Press of the country has an advertising revenue of some £2,000,000 a year, and can therefore afford to ignore so trifling a matter as the competition of the official publication.

We are in the most entire agreement with the whole of the points traversed by the letter with which we are dealing. The *Board of Trade Journal* is, doubtless, well edited and as well compiled, but the main point is that we do not want such a publication merely as a contribution to literature. Its main intention is to further the interests of British trade. To a certain extent it does so, but it has a relatively restricted currency, and its information is conveyed in a cumbrous and therefore expensive form. A really well-organised and conducted Press Department would serve the purpose far better, since it would circulate its information to the journals current in the trade to which that information might appeal and to those journals only. Thus there would be ensured an adequate circulation of all specialised news and information, and duplication of effort and cumbrousness would be avoided. All of which would manifestly be to the great advantage of British trade interests. We trust, therefore, that the suggestions contained in the letter under notice will receive the sympathetic consideration of the President.

No Monetary Gifts for Airmen.

An Army Order has been issued as an addition to King's Regulations, which was published in "FLIGHT" last week and which reads as follows :—

"Officers, warrant-officers, non-commissioned officers and men are forbidden to accept presents in money from public bodies or private individuals in recognition of services rendered in the performance of their duty."

Obviously this Order is the result of the gifts of money made in connection with the bringing down of enemy airships in England. It is quite understandable that individuals and bodies should evince a very praiseworthy desire to recognise the services to the community of the gallant officers and men who have taught the enemy that he cannot any longer raid these shores with impunity. The motive is an altogether admirable one, but we do not think the principle is one that ought to be recognised, or, at least, further exploited. Our air services do their duty because it is their duty, and not from any hope of financial gain. It will be a bad day for those services when any other than that feeling dominates them. Human nature, however, is human nature after all, and we are distinctly of opinion that it is not in the best interests of the Service that rewards in kind should be made to any individuals save officially. To encourage, or even to countenance, the principle of private reward would be to run a grave risk of introducing a spirit that the services are much better without. We have the best of reasons for knowing that these are the sentiments of the Service itself, and that the new Order is welcomed as putting into words something that has always been accepted as an unwritten principle.

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(*Official photo.*)

ON THE WESTERN FRONT.—A group of pilots, who are helping to make history, in front of one of the British machines.

The British Air Services

"PER ARDUA AD ASTRA"

Under this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the London Gazette, *it is not repeated in this column.*

Royal Naval Air Service. *Admiralty, October 17th.*

F. B. Rigby granted temp. commission as Lieut., and appointed to the "President," additional, for R.N.A.S., Oct. 14th.

Temp. Flight-Sub-Lieut. H. G. Brackley promoted to Flight-Sub-Lieut., seniority Oct. 1st.

The under-mentioned entered as Proby. Flight Officers for temp. service and appointed to the "President," for R.N.A.S., all date Oct. 22nd: V. R. Cox, W. H. Owen, J. W. Pinder, A. H. Webber, E. H. Jenkins, F. W. Akers, L. T. Clemence, R. L. Brown, J. A. Rudd, H. C. Nutt, M. J. Watson, T. H. Boyd, J. R. Attwell, P. F. T. Luckham, J. H. Broughton, F. L. B. Wood, D. A. Lancaster, A. J. R. F. Johnson and G. M. Emerson.

Admiralty, October 18th.

O. R. Gayford and A. W. Southam granted temp. commissions as Sub-Lieut., R.N.V.R., with seniority Oct. 15th and Oct. 12th respectively.

Admiralty, October 19th.

R. C. Philpott granted a temp. commission as Lieut., R.N.V.R., to date Oct. 18th.

The following granted temp. commission as Sub-Lieut., R.N.V.R., seniority as stated: Chief Petty Officer, A.A.C., N. C. D. Colman and Petty Officer J. C. Spurway, Oct. 17th; J. Milton and S. S. Tyler, Oct. 18th.

Chief Petty Officer, 2nd Grade, A. C. Jones and W. R. Curtis entered as Proby. Flight Officers for temp. service, date Oct. 17th and Oct. 22nd respectively.

Admiralty, October 20th.

T. V. Hughes and J. Coates entered as Proby. Flight Officers for temp. service, and appointed to the "President," additional, for R.N.A.S., date Oct. 19th and 18th respectively.

Admiralty, October 21st.

Temp. Lieut. (R.N.V.R.) T. A. Monckton promoted to Temp. Lieut.-Commander, with seniority Oct. 19th.

The following have been entered as Proby. Flight-Sub-Lieuts. for temp. service, to date as stated: A. C. Reid, Aug. 2nd; T. F. Fergie and A. M. Young, Sept. 27th.

Admiralty, October 23rd.

A. B. Wheldon granted a temp. commission as Lieut., R.N.V.R., with seniority Oct. 21st.

H. G. L. de Whalley and C. F. Pallott granted temp. commissions as Sub-Lieuts., R.N.V.R., with seniority Oct. 21st.

Royal Flying Corps (Military Wing).

London Gazette, October 17th.

Flying Officers.—Temp. 2nd Lieut. J. S. Cooper, York. and Lanc. R., and to be transferred to Gen. List; Sept. 19th. Sept. 22nd: Lieut. W. Halliwell (T.F. Res.); 2nd Lieut. D. S. Hall, Arg. and Suth'd. Highrs. (T.F.). Sept. 23rd: Lieut. H. D. E. Ralfe, Australian Fd. Art.; Temp. 2nd Lieut. W. C. Crawford, Machine Gun Corps, and to be transferred to Gen. List. Sept. 24th: Temp. 2nd Lieut. J. T. Collier, R.A., and to be transferred to Gen. List; 2nd Lieut. L. S. Bowman, R. Lanc. R. (T.F.); Temp. 2nd Lieut. C. A. Brewster-Joske, Gen. List, from a Flying Officer (Ob.), with seniority from Feb. 27th. Sept. 25th: 2nd Lieut. (on prob.) T. H. Butler, Bord. R., Spec. Res., and to be secd.; 2nd Lieut. (temp. Lieut.) C. L. Pickering, Ches. R. (T.F.); Temp. Lieut. A. V. Burlton, A.S.C., and to be transferred to General List; 2nd Lieut. (Temp. Lieut.) J. A. Parkinson, R. Lanc. R. (T.F.); Lieut. H. L. Kennedy, 70th Canadian Inf. Bn.; 2nd Lieut. H. C. Baker, Spec. Res. (since deceased); 2nd Lieut. C. E. S. Russell, Spec. Res.; Lieut. C. A. S. Bean, Canadian Gen. List; 2nd Lieut. F. H. Humphreys, Spec. Res.; 2nd Lieut. G. Lea, Spec. Res. 2nd Lieut. A. R. E. Henley, R. Scots (T.F.); Sept. 26th. Sept. 27th: Temp. 2nd Lieut. A. D. S. Catling, Devon R., and to be transferred to Gen. List; 2nd Lieut. D. K. Sworder, Spec. Res.; Temp. 2nd Lieut. (on prob.) L. I. Barker, Gen. List. Sept. 28th: Lieut. C. de P. D. Swain, Wessex (Howitzer) Brig., R.F.A. (T.F.); 2nd Lieut. (on prob.) R. A. James, Middx. R., Spec. Res., and to be secd.; Temp. 2nd Lieut. W. H. Irvine, Gen. List.

Balloon Officers.—2nd Lieut. (Temp. Lieut.) A. M. Van der Byl, H.A.C. (T.F.); Sept. 15th. Sept. 23rd: Temp. Capt. A. J. Mann, A.S.C., and to be transferred to Gen. List; Temp. Lieut. R. S. Lardner, Bedf. R.; 2nd Lieut. C. H. Gimingham, Herts R. (T.F.); 2nd Lieut. W. H. Chatham, Northn. R., Spec. Res., and to be secd.; Temp. 2nd Lieut. W. J. H. Horrocks, Gord. Highrs., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) V. J. Hammond, Gen. List; Temp. 2nd Lieut. (on prob.) S. Orchard, Gen. List; 2nd Lieut. (on prob.) W. P. Bingham, Spec. Res.; Temp. 2nd Lieut. J. L. Greener, Gen. List; Temp. 2nd Lieut. F. J. K. Mason, Gen. List; Temp. 2nd Lieut. F. B. Stevens, Gen. List; 2nd Lieut. (on prob.) F. H. Postlethwaite, Spec. Res.

Adjutants.—Lieut. W. B. Bryans, Norf. R., Spec. Res., and to be secd.; Sept. 25th. The appointment of Lieut. (Temp. Capt.) B. H. Bonham-Carter, 40th Pathans, Ind. Army, notified in the *Gazette* of Sept. 28th, is cancelled.

Equipment Officer, 3rd Class.—2nd Lieut. (on prob.) J. D. Coales, Special Reserve; Sept. 1st.

Memorandum.—1st Class Air-Mech. T. N. Gilbert from R.F.C. to be Temp. 2nd Lieut. (on prob.), for duty with the Military Wing of that Corps; Oct. 1st.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: H. J. Butler, R. M. Charley, T. T. Cumming, H. N. Stradling. The appointment of 2nd Lieut. E. S. Cohen, notified in the *Gazette* of July 27th, 1916, is antedated to June 21st, 1916. The undermentioned to be 2nd Lieuts. (on prob.):—Oct. 7th: W. H. G. Furnivall, W. L. Shaw, H. R. Williamson, J. F. B. Smith, H. Gray, J. H. Fletcher, A. Graham, G. K. Johnson, H. H. Leage, J. E. Terry and H. N. O'Donnell.

London Gazette Supplement, October 18th.

Flying Officers.—Temp 2nd Lieut. (on prob.) G. F. Mackay, Gen. List; Sept. 28th. Sept. 29th: Lieut. K. R. G. Fenwick, R.H. Gds., and to remain secd.; 2nd Lieut. H. J. Butler, Spec. Res.; Temp. 2nd Lieut. F. N. Insoll, Gen. List; 2nd Lieut. A. F. Barker, Hamps. R., and to be secd.; 2nd Lieut. (Temp. Lieut.) G. F. Knight, Devon. R., from a Flying Officer (Ob.), with seniority from April 29th; 2nd Lieut. (Temp. Lieut.) G. L. Colomb, Lond. R. (T.F.). Sept. 30th: 2nd Lieut. A. Gray, Arg. and Suth'd. Highrs. (T.F.); 2nd Lieut. J. C. Smith, E. Rid. of York. Yeo. (T.F.); 2nd Lieut. T. Thomson, Arg. and Suth'd. Highrs. (T.F.); 2nd Lieut. R. M. Charley, Spec. Res.; Temp. 2nd Lieut. F. W. Michell, Gen. List.

Flying Officers (Observers).—Sept. 29th: Lieut. H. E. Paquin, 22nd Canadian Inf. Bn.; Temp. Lieut. R. S. S. Brown, High. L.I., and to be transferred to Gen. List; 2nd Lieut. G. Chetwynd Stapylton, Yorks. L.I. (T.F.); 2nd Lieut. F. E. S. Phillips, Devon. R., Spec. Res., and to be secd. Oct. 1st: Temp. 2nd Lieut. V. Bayley, L'pool. R.; Temp. 2nd Lieut. H. E. Hervey, Gen. List.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. R. G. Meech, Gen. List; July 31st. 2nd Lieut. W. E. Bousfield, Spec. Res.; Aug. 4th. 2nd Lieut. A. W. Thompson, Spec. Res.; Aug. 7th. Aug. 8th: 2nd Lieut. (on prob.) T. McC. Yarwood, Spec. Res.; Temp. 2nd Lieut. A. G. Cox, Gen. List. Temp. 2nd Lieut. C. V. Thornton, Gen. List; Aug. 9th. 2nd Lieut. C. S. Hickie, Spec. Res.; Aug. 16th. Temp. 2nd Lieut. H. P. Bramwell, Arg. and Suth'd. Highrs., and to be transferred to Gen. List; Aug. 21st. Temp. Capt. W. E. Smith, A.S.C., and to be transferred to Gen. List; Aug. 24th. Sept. 18th: Temp. 2nd Lieut. (on prob.) W. J. R. Sheppard, Gen. List; Temp. 2nd Lieut. (on prob.) J. W. Maddock, Gen. List.

Memoranda.—Acting Sergt.-Major J. P. Angell, R.F.C., to be 2nd Lieut. for duty with R.F.C., Oct. 19th.

To be 2nd Lieuts. (on prob.) for duty with R.F.C.: Pte. E. L. Ravenscroft, from A.S.C., Oct. 2nd; F. D. Reynolds, Oct. 7th.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) J. I. Jones resigns his commission; Oct. 19th.

London Gazette Supplement, October 19th.

Squadron Commander.—Capt. L. Jenkins, Dorset R.G.A. (T.F.), from a Flight-Commander, and to be Temp. Major whilst so employed; Sept. 20th.

Flying Officers.—2nd Lieut. R. A. Denne, Wilts. R., and to be secd.; July 30th. 2nd Lieut. (on prob.) J. Smyth, Spec. Res.; Sept. 22nd. Sept. 29th: Temp. Lieut. F. A. George, 16th Northd. Fus., and to be transferred to Gen. List; 2nd Lieut. (Temp. Lieut.) T. F. Burrill, Montgomeryshire Yeo. (T.F.); Temp. Lieut. L. S. Arbuthnot, A.S.C., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) R. B. Corfield, Gen. List; Temp. 2nd Lieut. (on prob.) E. V. Gibson, Gen. List; Temp. 2nd Lieut. (on prob.) A. H. Hodgson, Gen. List; 2nd Lieut. A. H. Whistler, Dorset. R., and to be secd. Sept. 30th: Temp. Capt. C. N. Lowe, A.S.C., and to be transferred to Gen. List; 2nd Lieut. (Temp. Lieut.) A. H. C. Bruce, R.A., and to be secd.; Temp. 2nd Lieut. C. S. Fulton, R.Sc. Fus., and to be transferred to Gen. List; Temp. 2nd Lieut. A. W. Wood, W. York. R., and to transferred to Gen. List.

Flying Officers (Observers).—2nd Lieut. E. Y. FitzGerald, Herts. Yeo. (T.F.); July 1st. July 15th: Lieut. H. D. Williams, Auckland Mtd. Rifles, N. Zealand Contingent; Temp. 2nd Lieut. G. C. Heseltine, E. York. R., and to be transferred to Gen. List; Temp. 2nd Lieut. F. E. Hillebrandt, Suff. R., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) H. E. Judge, Gen. List. 2nd Lieut. C. D. Thompson, H.A.C. (T.F.); July 24th. Aug. 1st: Temp. Lieut. S. F. Lydon, A.S.C., and to be transferred to Gen. List; 2nd Lieut. N. Clark, E. Lan. Brig., R.F.A. (T.F.); 2nd Lieut. E. T. H. Ellis, S. Mid. Divl. Sigl. Co., R.E. (T.F.); Temp. 2nd Lieut. (on prob.) F. G. Ibbett, Gen. List; 2nd Lieut. E. T. Shand, Otago Mtd. Rifles, N. Zealand Contingent. Aug. 15th: Temp. Capt. J. Leacroft, A.S.C., and to be transferred to Gen. List; Lieut. A. B. Jarvis, Middx. R. (T.F.); 2nd Lieut. S. S. Hume, 1st Co. of Lond. Yeo. (T.F.); 2nd Lieut. A. I. Campbell-Robertson, 18th Hrs., and to be secd. Aug. 25th: Lieut. A. G. Adams, 5th Bn. (Victoria), Australian Imperial Force; Lieut. D. W. Rutherford, 5th Regt. (Queensland), Australian Light Horse; Temp. 2nd Lieut. J. F. Alcock, Bedf. R., and to be transferred to Gen. List. Sept. 1st: Temp. Capt. (Temp. Major) H. R. Coningsby, Middx. R.; 2nd Lieut. (Temp. Capt.) J. Longton, A.S.C., and to be secd.; Temp. 2nd Lieut. H. G. G. Joynson, R.A., and to be transferred to Gen. List; Temp. 2nd Lieut. J. C. Watson, R. Fus., and to be transferred to Gen. List; Temp. 2nd Lieut. E. R. Cottier, R.A., and to be transferred to Gen. List. 2nd Lieut. D. N. Thomson, Glasgow Yeo. (T.F.); Sept. 3rd. Temp. 2nd Lieut. F. Libby, Gen. List; Sept. 26th.

Equipment Officers, 3rd Class.—2nd Lieut. H. F. Groves, Northd. Fus. (T.F.); Sept. 2nd. Sept. 11th: Temp. 2nd Lieut. (on prob.) V. W. Allen, Gen. List; Temp. 2nd Lieut. (on prob.) J. H. Dale, Gen. List. Temp. 2nd Lieut. A. C. Day, Gen. List; Sept. 29th. 2nd Lieut. W. J. King, N. Staff. R., and to be secd.; Sept. 30th.

Memoranda.—Acting Sergt.-Major J. Baxter, R.F.C., to be 2nd Lieut., for duty with R.F.C.; Oct. 12th. The under-mentioned Temp. 2nd Lieuts. to be Temp. Lieuts., whilst serving with R.F.C.:—Sept. 1st: H. L. Lascelles, A. Ellison, H. B. Denton, S. O. Barnsdale, R. F. Wills, A. M. Thom, R. B. Fricker, S. G. Kingsley, R. P. Willock, R. F. Sinclair, L. E. Eeman, H. Hamer, C. B. Cooke, W. J. Y. Guilfoyle, H. H. James. Cadet J. B. Crabb to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Oct. 7th

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. to be Lieuts.:—Sept. 1st: (Temp. Capt.) V. A. H. Robeson, (Temp. Capt.) J. P. C. Sewell, (Temp. Capt.) C. C. Miles, J. L. Williams, (Temp. Capt.) J. Latta, (Temp. Capt.) R. W. Nichol, W. C. Mortimer-Phelan, (Temp. Capt.) H. G. Salmond, (Temp. Capt.) M. Le Blanc-Smith, (Temp. Capt.) D. Joy, (Temp. Capt.) J. A. Crook, (Temp. Capt.) C. G. Tucker, (Temp. Capt.) F. J. H. Thayre, (Temp. Major) H. Lee, J. S. Castle. The under-mentioned to be 2nd Lieuts.: Aug. 17th: C. G. Nevatt, S. B. Browning, R. W. Anderson, W. K. Cannon; Aug. 27th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: J. Smyth, W. B. Kellogg, A. Edwards. The under-mentioned to be 2nd Lieuts. (on prob.): C. Deards; Sept. 9th. J. Ferguson; Oct. 9th.

London Gazette, October 20th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: Temp. Lieut. C. E. I. C. Anne, Gen. List; Aug. 6th. Temp. 2nd Lieut. N. W. Webb, Gen. List; Oct. 4th. Temp. Lieut. J. R. Philpott; Oct. 7th.

Flying Officers.—Sept. 22nd: 2nd Lieut. (Temp. Capt.) H. C. Stroud, Northumbrian R.E. (T.F.); 2nd Lieut. L. R. Kerridge, Spec. Res. 2nd Lieut. A. Edwards, Spec. Res.; Oct. 1st. Oct. 2nd: 2nd Lieut. (Temp. Lieut.) H. G. Amis, York. R. (T.F.); Temp. 2nd Lieut. A. G. Cardwell, Gen. List; Temp. 2nd Lieut. L. F. Jones, Gen. List.

Equipment Officers, 3rd Class.—2nd Lieut. J. McCrae, Sea. Highrs.; Sept. 1st. Sept. 18th: 2nd Lieuts., Spec. Res.: R. W. Anderson, S. B. Browning, W. K. Cannon, C. G. Nevatt, F. W. Beard, C. B. Willcocks. Temp. 2nd Lieut. H. F. Bradley, Gen. List, from a Flying Officer; Oct. 4th.

Memoranda.—The under-mentioned to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.:—Oct. 7th: Air-Mech. S. Sergt. A. W. Barnett, from A.S.C.; Pte. S. H. Child, from A.S.C.; Sapper A. Smellie, from Lond. Electrical Engrs. (T.F.); Cadet S. R. Winkworth.

General List.—The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.:—Sept. 26th: G. E. Brookes, J. K. Chatham, G. I. Fry, E. L. Humpherus, B. F. Parsons, E. R. Payne, N. V. Spear, G. S. Wood, A. H. Waterman, P. W. Wilcox, F. V. Way, C. P. Beadon, P. S. Bell, J. C. B. Brown, P. R. Cann, T. E. Carley, W. A. Clark, R. L. Curtis, P. C. Felts, E. A. R. Fowles, E. S. Guy, H. V. Headland, A. J. P. Hytch, A. Jackson, R. H. Latham, A. W. Little, H. P. Ledger, D. T. Leyshon, G. B. Mason, P. L. McGavin, V. L. Monsell, L. B. Moor, H. Morley, L. F. Duval, P. Kent, J. A. Pattern, A. R. Penny, K. W. Bransby, H. Briggs, T. W. Calvert, W. Casson, J. Frost, J. Handley, S. Hewett, E. P. Holloway, H. Horrocks, W. Hunt, N. H. Lahaye, H. P. Lale, G. S. Lee, P. I. Lewis, A. F. Sheppard, D. A. Strutt, F. Sumpter, F. Thompson, S. Thompson, S. S. Turnbull, J. R. Waller, J. L. Walton, A. E. Wear, C. L. Whitburn, F. C. Wild, R. Wilson, T. A. Langford-Sainsbury, H. A. Payne, J. H. Walker, A. H. Craig, C. A. Farquharson, M. B. Frew, J. G. Blane, D. S. Gray, N. V. Harrison, J. Henry, J. Johnstone, P. E. Kerr, T. H. MacDonald, T. MacMillan, N. McLeod, N. MacMillan, F. W. Maclean, A. R. Martin, W. C. McMurray, W. Turnbull, P. R. Adams, C. S. Atkinson, F. F. Babbage, P. H. Baker, T. H. Bowen, S. R. Burton, A. Critchley, R. Dutton, F. Fowler, R. Grant, B. A. Gunner, J. E. B. Hesketh, T. J. Hudson, L. M. Hughes, C. A. Hyde, S. Leith, W. Moulding, N. R. Muir, J. L. Murray, H. F. Nicholls, D. L. Nutt, L. A. Rivers, P. Robinson, B. Strachan, V. S. Taylor, S. Thompson, J. Toulmin, J. A. Westerman, L. A. Weston, W. Allan, F. V. Bryant, F. N. Clark, W. T. Edwards, F. L. Garner, E. R. Haines, J. Hancock, O. C. Pearson, L. F. Clark, B. E. Carter, F. Doherty, J. G. H. Frew, D. P. Glazer, A. Hartley, G. S. King, C. W. Lewis, R. F. Mullins, A. G. Platt, D. J. Reason, E. G. Roberts, T. Robinson, B. F. Sandy, S. E. M. Simpson, P. Wilson, R. D. Boyd, R. de R. Brett, H. P. Connar, W. Dawson, J. A. French, T. M. McFerran, M. J. McGarry, J. J. Malone, E. M. Meredith, E. T. Molyneux, T. M. O'Neill, J. J. Tivenan, D. P. Wilson, S. Pickford.

Supplementary to Regular Corps.—The undermentioned to be 2nd Lieuts. (on prob.): J. Paradise; Sept. 10th. C. E. Bagram; Oct. 7th.

London Gazette Supplement, October 21st.

Flight-Commander.—Lieut. P. C. Sherran, 40th (Res.) Can. Inf. Bn., from a Flying Officer, and to be Temp. Capt. whilst so employed; Oct. 6th.

Flying Officers.—Sept. 29th: 2nd Lieut. (Temp. Lieut.) H. A. R. Boustead, Middx. R. (T.F.); 2nd Lieut. H. J. Brewster, Middx. R., and to be secd.; 2nd Lieut. W. B. Kellogg, Spec. Res. 2nd Lieut. C. L. Bullock, Rif. Brig., Spec. Res., from a Flying Officer (Ob.), with seniority from March 1st. Sept. 30th: Capt. R. Oxspring, Yorks. L.I., Spec. Res., from a Flying Officer (Ob.), with seniority from May 31st; Lieut. E. J. Y. Grevelink, W. Rid. R., and to be secd. Temp. 2nd Lieut. M. W. Dickens, Gen. List; Oct. 2nd. Oct. 4th: Capt. J. E. Mackay, 95th Canadian Inf. Bn.; Temp. 2nd Lieut. A. A. Patterson, Bord. R., and to be transferred to the Gen. List; 2nd Lieut. R. H. Lemon, R. W. Surr. R. (T.F.).

Flying Officer (Observer).—The initials of Temp. 2nd Lieut. J. B. R. Langley, Gen. List, are as now described, and not as in the *Gazette* of Sept. 22nd, 1916.

Memoranda.—Lieut. W. Halliwell, T.F. Res., Gen. List, to be Temp. Lieut., Gen. List, for duty with R.F.C.; Sept. 22nd. Lieut. J. H. Cock, N. Zealand Expeditionary Force, to be Temp. 2nd Lieut. (on prob.), for duty with R.F.C.; Sept. 25th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: H. S. Lees-Smith, H. Whitehead, A. E. Squire, T. Woodman. The under-mentioned to be 2nd Lieuts. (on prob.): F. C. R. Johnson; Sept. 7th. C. C. Cruttenden; Oct. 7th.

London Gazette Supplement, October 23rd.

The under-mentioned Warrant Officers, N.C.Os. and men to be Temp. 2nd Lieuts. (on prob.), for duty with the R.F.C.: Petty Officer A. G. Tremain, from R.N.A.S.; Sept. 8th. Pte. C. P. R. Holdcroft, from Headquarters Staff, Can. Div.; Sept. 10th. Pte. A. N. Martyn, from Lond. R. (T.F.); Sept. 11th. Corpl. W. J. Gray, from Can. Corps, Cav. Regt.; Sept. 12th. Sept. 15th: Staff-Sergt.-Major A. H. Cabeldu, from A.S.C.; L.-Sergt. H. B. Mann, from 10th R. Fus.; Gnr. J. Michie, from M.G.C.; Gnr. G. Maddock, from R. Can. H.A.; Pte. J. E. Le Gallais, from Can. A.S.C.; Pte. H. R. Hare, from Can. A.S.C.; Pte. P. L. Goudie, from Can. A.S.C.; Pte. G. H. Glendenning, from M.G.C. Sept. 19th: Corpl. A. W. Clarke, from R.E.; Corpl. C. T. Keble, from R.F.C.; 1st Class Air-Mech. J. Watson, from R.F.C.; 1st Class Air-Mech. C. H. Mendham, from R.F.C.; 2nd Class Air-Mech. W. W. Fitzgerald, from R.F.C. Sept. 21st: Acting Sergt. H. C. Barr, from Can. A.S.C.; Pte. R. Davis, from Can. Corps, Cav. Regt. Pte. N. M. H. Vernham, from A.S.C.; Sept. 22nd. Sept. 24th: Acting Corpl. C. St. C. Acheson, from Can. A.S.C.; 2nd Class Air-Mech. J. G. Beckham, from R.F.C.; Pte. V. C. Manuel, from Can. A.S.C.

Flying Officers.—Sept. 18th: 2nd Lieut. (Temp. Lieut.) E. C. Lansdale, W. Lan. A.S.C. (T.F.); 2nd Lieut. (on prob.) A. R. M. Scrase-Dickens, K.R. Rif. C., Spec. Res., and to be secd. Oct. 4th: 2nd Lieut. W. W. Sawden, E. Rid. R.G.A. (T.F.); 2nd Lieut. F. R. Hudson, Spec. Res. Temp. 2nd Lieut. R. L. Dingley, 14th Worc. R., and to be transferred to Gen. List; Oct. 7th.

Memoranda.—To be Temp. 2nd Lieuts. for duty with R.F.C.:—Sept. 10th: Coy.-Sergt.-Major J. A. Payne, Regtl. Sergt.-Major F. H. Hawksford. To be Temp. 2nd Lieuts. (on prob.): Pte. G. K. Cathles, from Lond. R. (T.F.), for duty with R.F.C.; Sept. 9th.

Supplementary to Regular Corps.—The surname of 2nd Lieut. (on prob.) J. D. Coales is as now described, and not as in the *Gazette* of Sept. 6th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: J. D. Coales, C. Kennard, J. J. Bartlett, C. W. Barnsley, W. F. J. Matthews, H. I. Allen, F. H. O'Beirne, A. L. Challis, E. M. Leete, F. R. Hudson. J. D. Campion to be 2nd Lieut; Sept. 9th. The under-mentioned to be 2nd Lieuts. (on prob.):—Aug. 24th: F. Ryder, J. Page, J. Farquharson, W. T. Davis, H. Hoad. G. Barfoot-Saunt; Aug. 27th. E. D. C. Herne; Oct. 1st. Oct. 6th: S. C. Foster, E. B. Denison, R. R. Riggs, W. Wells, J. C. Noble, J. H. Muir, D. W. McGregor, C. Knowles, R. C. Steele.

Central Flying School. *London Gazette, October 17th.*

Instructors.—Temp. Lieut. (Temp. Capt.) J. C. Russell, R.E., a Flight-Commander; July 1st. 2nd Lieut. (Temp. Capt.) S. G. Hodges, Wilts. R., a Flight-Commander; Aug. 1st.

School of Aerial Gunnery.

London Gazette Supplement, October 18th.

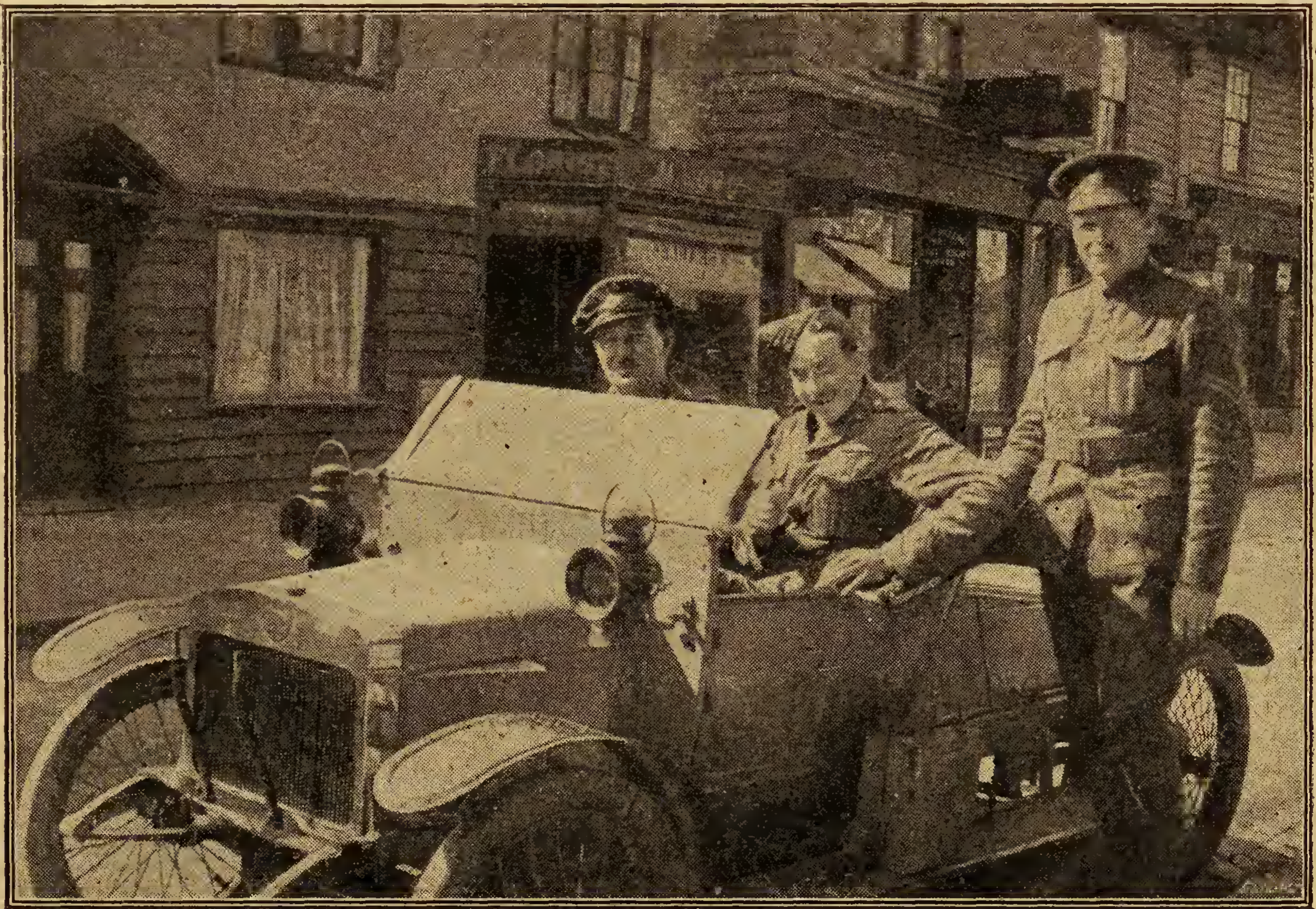
Commandant (graded as a Wing Commander).—Lieut. (Temp. Major) L. A. Strange, Dorset R., from a Squadron Commander, and to be Temp. Lieut.-Col. whilst so employed; Sept. 13th.

Chief Instructor (graded as a Park Commander).—Lieut. (Temp. Capt.) H. E. Chancy, Lan. Fus., from an Equipment Officer, and to be Temp. Major whilst so employed; Sept. 13th.

Instructors (graded as Equipment Officers, 1st Class).—From Asst. Equipment Officers, and to be Temp. Capts. whilst so employed:—Sept. 13th: Temp. 2nd Lieut. (Temp. Lieut.) F. G. Wilson, Gen. List; Temp. 2nd Lieut. S. W. Cooper, Gen. List.

Staff Officer, 2nd Class (graded for Pay as a Brigade Major).—Capt. K. B. Harbord, R.A., from a Flying Officer; Sept. 13th.

Adjutant.—Temp. Qmr. and Hon. Lieut. H. R. Howarth, Gen. List, and to be Temp. Capt. whilst so employed; 13th Sept.



A snapshot of Lieutenant Tempest, R.F.C., who was recently awarded the D.S.O. in connection with bringing down Zeppelin raiders.

FURTHER REWARDS FOR R.F.C.

In a supplement to the *London Gazette*, issued on October 20th, it was announced that H.M. the King has been graciously pleased to approve of the appointments of the under-mentioned officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the field :—

Capt. William D. S. Sanday, M.C., R.F.C.

For conspicuous gallantry and skill. He has led over thirty-five patrols with great gallantry. On one occasion a machine of his formation was attacked, but he charged and brought down the enemy machine in flames. He has destroyed at least four enemy machines.

Lieut. (Temp. Capt.) Alan M. Wilkinson, Hamps. R. and R.F.C.

For conspicuous gallantry and skill. He has shown great dash in attacking enemy machines, and up to the end of August he had accounted for five. On one occasion, while fighting a hostile machine, he was attacked from behind, but outmanœuvred the enemy and shot him down. Finally he got back, his machine much damaged by machine-gun fire.

H.M. the King has also been graciously pleased to confer the Military Cross on the under-mentioned officers in recognition of their gallantry and devotion to duty in the field :—

Lieut. (Temp. Capt.) Leslie P. Aizlewood, York. and Lanc. R. and R.F.C.

For conspicuous gallantry and skill. Seeing five hostile machines, he manœuvred to get between them and their lines, then, diving on one of them, he reserved his fire till he was only 20 yards off. The hostile machine fell out of control, but he was so close to it that he collided with it, breaking his propeller and damaging his machine. Though it was barely controllable, he managed to get back to our lines.

Second Lieut. (Temp. Capt.) John O. Andrews, R. Scots and R.F.C.

For conspicuous gallantry and skill. He is a fine leader of offensive patrols, and has himself shot down four enemy machines. On one occasion he got within 25 yards of an enemy machine under heavy fire and brought it down a wreck.

Second Lieut. (Temp. Lieut.) Alan D. Bell-Irving, Gord. Highrs., Spec. Res., and R.F.C.

For gallantry and skill in attacking a hostile balloon at 1,000 ft. under heavy fire and bringing it down in flames. On a previous occasion he brought down a hostile machine.

Temp. Second Lieut. (Temp. Capt.) Keith R. Binning, Gen. List and R.F.C.

For conspicuous gallantry and skill, notably when he made two contact patrol flights over the enemy's trenches at a height of under 1,000 ft. His machine was repeatedly hit by machine-gun and rifle fire, but he rendered exact reports of the position of our own and the enemy's troops. On another occasion he did similar fine work.

Second Lieut. Alan J. Bott, R.G.A., Spec. Res. (attd. R.F.C.).

For conspicuous gallantry and skill. As observer he has been in many fights, and furnished many good reports. On one occasion, when his pilot was gliding back to our lines after his engine had been hit and stopped, he drove off an attacking aeroplane and put out with his hands a fire started by anti-aircraft guns. On another occasion, after driving down one hostile aeroplane, he fired at another, which dived and collided with a third. This last one fell vertically.

Second Lieut. Walter H. C. Buntine, Notts. and Derby R. and R.F.C.

For conspicuous gallantry and skill. As escort to a bombing raid he attacked several hostile machines, one of which fell to the ground nose first. Later he was attacked by three enemy machines, his own machine being damaged and himself severely wounded. With great skill he managed to land in our lines, though most of his propeller was shot away and his machine otherwise much damaged.

Second Lieut. Clifford W. Busk, Suff. R. and R.F.C.

For conspicuous gallantry and skill. He has taken part in many reconnaissances and fights, and on one occasion shot down an enemy aeroplane. On another occasion, when his pilot's control wires were cut and the machine went into a spin, he helped to restore stability by leaning far out on the upper side, and remained in this position till the machine got home.

Second Lieut. (Temp. Capt.) James L. Chalmers, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He has done much fine counter-battery work, often flying very low under heavy fire from the ground. On one occasion one of our shells broke the main spar of his machine. On another, in one flight, he dealt effectively with four enemy batteries.

Temp. Second Lieut. Charles T. Cleaver, Gen. List.

For conspicuous gallantry and skill. He has shown great dash in contact patrol work at very low altitudes. On one occasion he obtained good information of a trench flying at 500 ft. under heavy fire from rifles and machine guns.

Temp. Second Lieut. Leslie F. Forbes, Gen. List and R.F.C.

For conspicuous gallantry and ability in attacking hostile machines and bombing railway lines, especially on one occasion, when he descended to 350 ft. in order to accomplish his object.

Second Lieut. Euan J. L. W. Gilchrist, Lrs. and R.F.C.

For conspicuous gallantry and skill when he attacked a hostile balloon and brought it down in flames, although under heavy fire and attacked by six hostile machines.

Second Lieut. (Temp. Capt.) Ian H. D. Henderson, Arg. and Suth'd. Highrs.

For conspicuous gallantry and skill on several occasions. He drove down a machine out of control, and two days later dispersed six enemy machines which were attacking his formation. A few days later again he brought down an enemy biplane, the observer being apparently killed. A week after this he attacked and drove down another machine which had wounded his leader. He has also carried out several excellent contact patrols and attacked retiring artillery and a kite balloon.

Second Lieut. Geoffrey T. R. Hill, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He attacked an enemy kite balloon under very difficult circumstances, and continued firing until he was within 20 ft. of it. He was then only 1,000 ft. from the ground, and under heavy fire from anti-aircraft and machine guns, but on looking round he saw the burning wreckage of the balloon on the ground.

Capt. Henry J. F. Hunter, Rif. Brig. and R.F.C.

For conspicuous gallantry and skill. He has done fine work for the artillery, and has accounted for many enemy guns. On one occasion, when a heavy storm drove all other machines back to their aerodromes, and the enemy guns took the opportunity to become active, he remained up and did fine work.

Second Lieut. (Temp. Capt.) Charles C. Miles, R.F.C., Spec. Res.

For conspicuous gallantry and skill. He has shown great dash in contact patrol work. On one occasion he reconnoitred an enemy trench at 500-ft. altitude, under heavy fire, which severely damaged his machine. Five days later, while working at 600 ft., he was severely wounded.

Temp. Capt. Kenneth N. Pearson, Gen. List and R.F.C

For conspicuous gallantry and skill. With one other pilot he attacked 10 hostile aeroplanes. The other pilot had his controls cut and had to return, but Capt. Pearson fought on till all the enemy aeroplanes were dispersed. On another occasion he bombed trains from a low altitude. He has done other fine work.

Second Lieut. Fenton E. S. Phillips, Devon. R., Spec. Res. and R.F.C.

For conspicuous gallantry and skill. He has done fine contact patrol work. On one occasion he came down to a low altitude while making a report, and his machine was much damaged by rifle and machine-gun fire, but he carried on, and successfully put our artillery on to the enemy, who were massing for a counter-attack.

Temp. Lieut. John R. Philpott, Gen. List and R.F.C.

For conspicuous gallantry and skill in descending to about 300 ft. under heavy fire of all descriptions in order to bomb a train. Finding that Captain Tyson had wrecked the train, he dropped his bombs on a station, and then assisted him to beat off hostile machines. He then, with Captain Tyson, attacked a machine which was endeavonring to leave the ground. He has previously displayed great gallantry.

Temp. Lieut. **David H. Scott**, Army Cyclist C. and R.F.C.

For conspicuous gallantry and skill. With Second Lieut. Turk as pilot, he attacked seven hostile machines flying in formation, and brought down one as a wreck.

Second Lieut. **Bernard V. S. Smith**, R. War. R. and R.F.C.

For conspicuous gallantry and determination on several occasions when dropping bombs from a low altitude on points behind the enemy's lines.

Second Lieut. **Herbert H. Turk**, R.F.C., Spec. Res.

For conspicuous gallantry and skill. With Lieut. Scott as observer he attacked seven hostile machines flying in formation. One was brought down as a wreck. When turning to meet another machine his rudder controls were shot away, and his machine got into a spinning nose-dive. After falling 5,000 ft. he partially regained control, and, though his machine kept on turning, he managed to land safely. The machine was badly damaged, but, thanks to his skill, neither he nor his observer were hurt.

Temp. Capt. **Eric J. Tyson**, Gen. List and R.F.C.

For conspicuous gallantry and skill during bombing raids. Descending to about 300 ft. under heavy fire of all descriptions, he succeeded in wrecking a train. Whilst doing this he was attacked by other hostile machines, which he beat off with the assistance of Lieut. Philpott, in another machine. Although wounded and with engine severely damaged, he attacked with Lieut. Philpott a group of men who were endeavouring to start a hostile machine, and scattered them in all directions. His machine was riddled with bullets.

Temp. Capt. (Flight-Commander) **Kenneth R. Van der Spuy**, R.F.C.

For conspicuous gallantry and skill. He flew for 4½ hours under dangerous climatic conditions, and brought back information of great value.

The under-mentioned officers have been awarded a bar to their Military Cross for subsequent acts of conspicuous gallantry :—

Second Lieut. **Sidney E. Cowan**, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and skill. He has done fine work in aerial combats, and has shot down four enemy machines.

Capt. **Alfred G. Moore**, M.C., Manch. R., Spec. Res. and R.F.C.

For conspicuous gallantry and skill. While fighting he had several wires shot away and his main spar damaged. His machine went into a spinning nose-dive. Nevertheless he finally managed to get some sort of control, and landed safely in an aerodrome.

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A Zeppelin Memorial.

By way of commemorating the descent of a Zeppelin in flames, the inhabitants of an Essex village near where it fell have decided to erect a tablet in the parish church, and are asking the authorities to present the necessary aluminium for making the tablet.

Air Work in Mesopotamia.

In the list of officers, and non-commissioned officers mentioned in the despatch (*London Gazette Supplement*, October 19th) of Lieut.-General Sir Percy Lake for their meritorious services in the course of the operations in Mesopotamia from January 19th to April 30th, including the efforts in the further attempt to relieve Kut, are the following :—

Staff and Headquarters.—Capt. (Temp. Major) P. W. L. **Broke-Smith**, R.F.C.

Royal Flying Corps.

Lieut. R. E. **Cuff**, N. Lanc. R., Spec. Res. ; Lieut. T. M. **Dickinson**, 16th Cav. ; Capt. J. W. **Thomson-Glover**, 35th Sikhs ; Brevet-Major S. D. **Massy**, D.S.O., 29th Punjabis ; Second Lieut. I. R. **McCrindle**, Spec. Res. ; Lieut. (Temp. Capt.) J. O. C. **Orton**, Norfolk R. ; Capt. H. **Petre**, Australian F.C. ; Second Lieut. (Temp. Capt.) W. R. **Wills**, Ind. Army Res. of Off.

No. 43 Flight-Sergt. G. J. W. **Mackinalty**, No. 4474 Flight-Sergt. R. J. **Tomlinson**, No. 4477 Flight-Sergt. A. **Webb**.

In the list of officers recommended by Major-General Townshend for distinguished service during the defence of Kut-el-Amara is the following :—

Royal Flying Corps.—Flight-Commander S. C. **Winfield Smith**, Capt. E. Surr. R., Spec. Res.

In the same supplement it was announced that H.M. the King had been graciously pleased to approve of the under-mentioned reward for distinguished service in the field, with effect from June 3rd, 1916, inclusive :—

D.S.O.

Capt. and Brevet-Major H. L. **Reilly**, Punjabis and R.F.C.

Medals for the R.F.C.

In a supplement to the *London Gazette* issued on October 18th, it was announced that H.M. the King has been pleased to award the Meritorious Service Medal to the following in recognition of valuable services rendered during the present war :—

Flight-Sergt. R. G. **Foster**, R.F.C.

In a supplement to the *London Gazette* issued on October 22nd, it was announced that H.M. the King has been graciously pleased to award the Military Medal for bravery in the field to the following :—

2173 Sergt. G. J. **Morton**, R.F.C.

* * *

A Dispute Settled.

At a conference held on October 20th at the offices of the Labour Adviser, a settlement was reached in the dispute affecting the wages of woodworkers in the aeroplane industry, and it was decided that the men should receive war bonuses of 2*s*. to 4*s*. a week according to their wages.

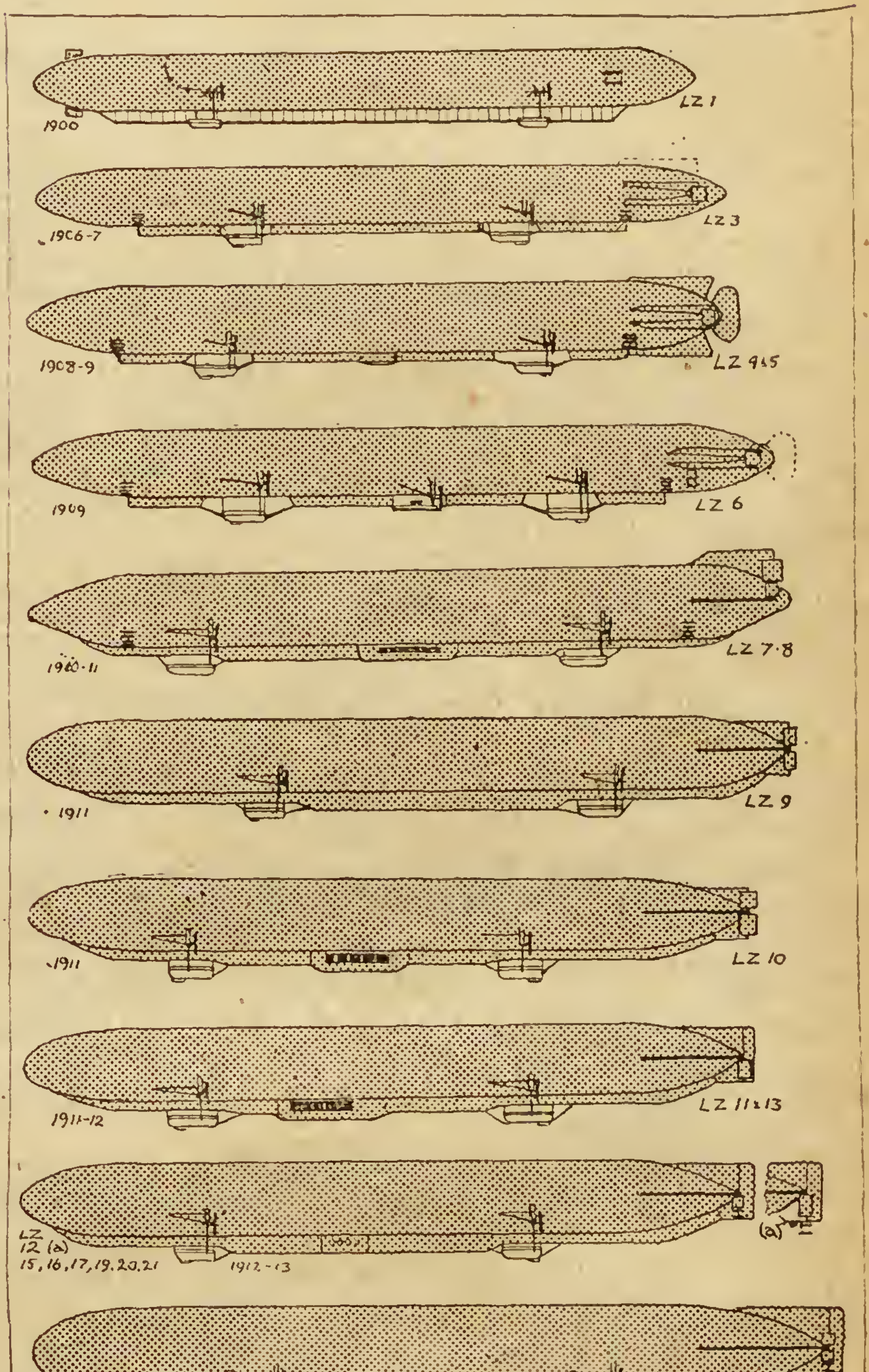
The silver plaque, which measures 72 by 100 mm., offered to French bombers by the League Aé. France. The obverse and reverse.

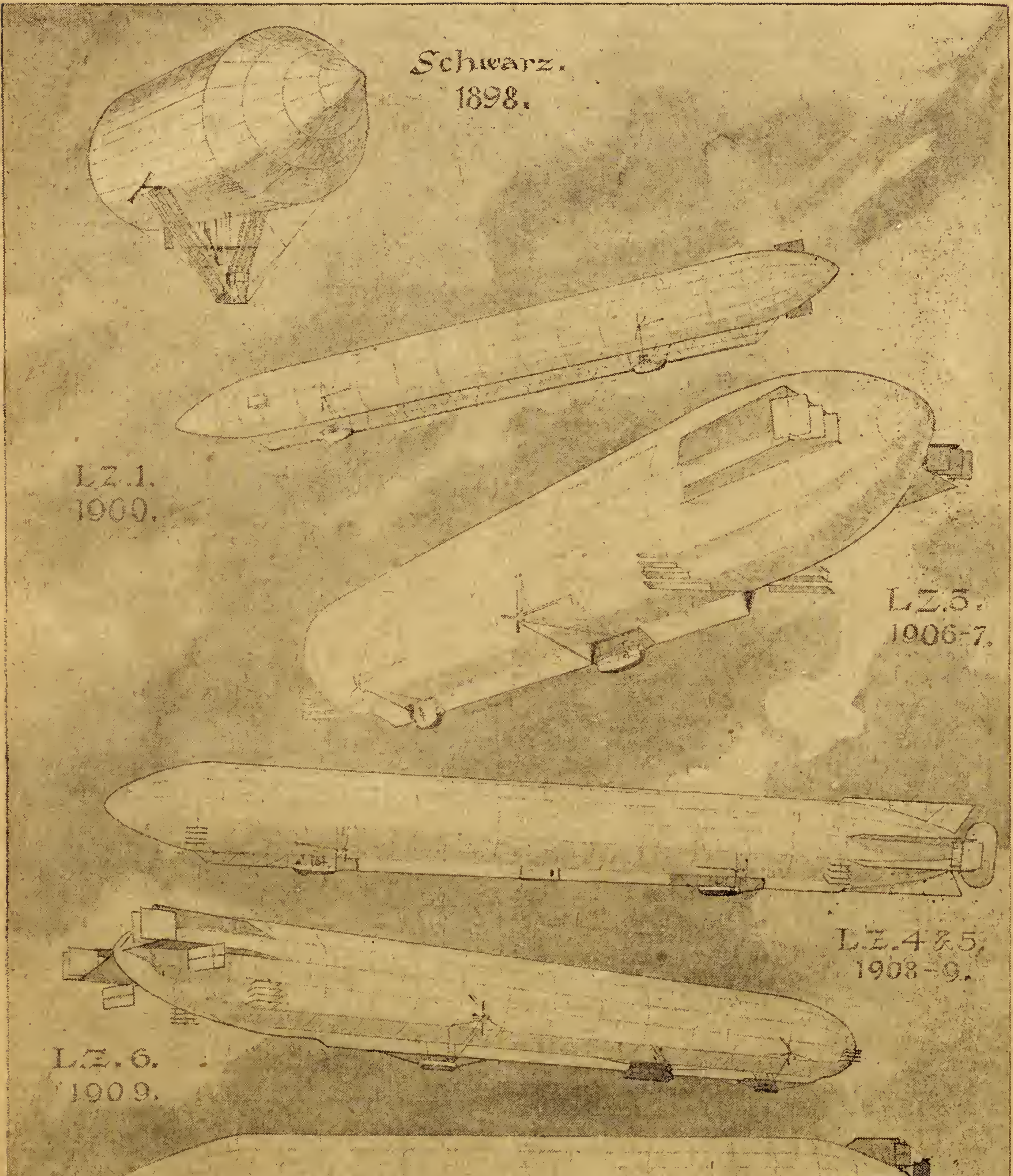
THE EVOLUTION OF THE GERMAN AIRSHIP FLEET.

By way of introduction to our description of L33, which follows, it is not inappropriate to give once again the briefest of historical *résumés* of the evolution of the Zeppelin. An absolutely complete history would fill far more space than we have at our disposal in this issue, but the following brief pedigree of the various models turned out from the first up to the year 1914, together with the accompanying diagrams and illustrations, should give a very fair idea as to the progress made by this type of aircraft. It should be mentioned, however, that this progress has already been chronicled, not only in "FLIGHT," from Vol. I, in 1908, but in the pages of its parent, the "*Auto.*," for many years before.

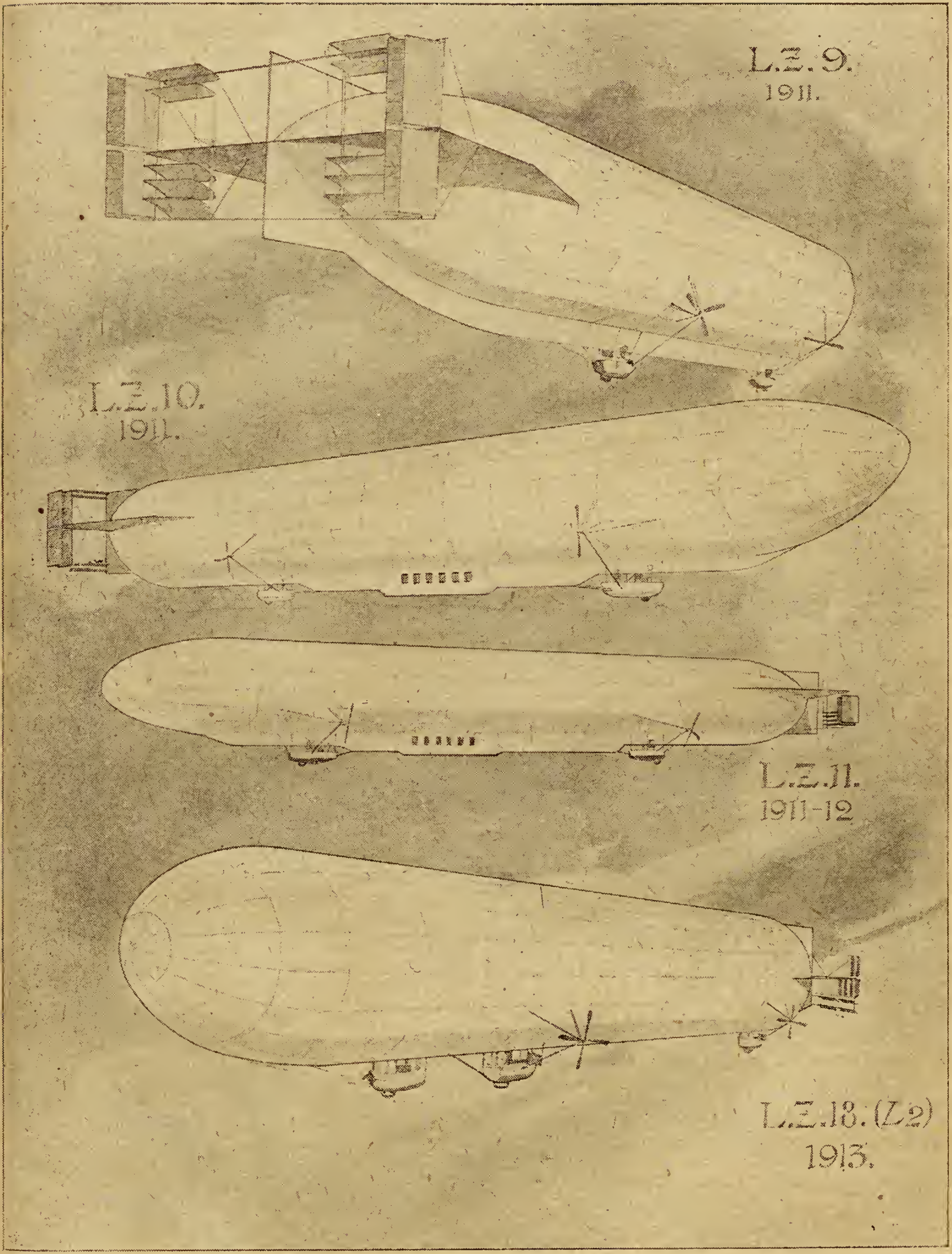
It was in 1893 that Count Ferdinand von Zeppelin, inspired by the efforts of D. Schwarz, got out the designs of his first rigid airship with the help of his chief engineer, Kober; but it was not until 1898 that he started in earnest on the construction of LZ1. This airship was completed, and made its first trials over Lake Constance, in July, 1900. In general design it was much the same as those that followed, viz., a long aluminium framework, made up into compartments containing the gas-balloons, having an outside covering of fabric and two cars or gondolas suspended beneath it. It was 420 ft. long and 38 ft. 6 ins. in diameter, and had a capacity of 400,000 cubic ft. The two gondolas each had one 16 h.-p. Daimler motor, which drove a pair of propellers, mounted one on either side of the ship. The trials of LZ1 not being very successful, it was broken up in 1902. Three years later LZ2 made its appearance, but on its second trial was destroyed beyond repair, in January, 1906.

LZ2 was very similar to LZ1, but measured 413 ft. in length and had a capacity of 367,500 cubic ft. This time two 85 h.p. motors were employed, and the results, though cut rather short, were certainly more promising. A third airship was, therefore, immediately got in hand, and was completed in October, 1906. LZ3 turned out to be a comparative success, and was, in fact, the model upon which subsequent ships were based. It was of the same size as LZ1, but with an extra capacity of 4,000 cubic ft. The two motors were of 85 h.p. each, and the covered-in "cat-walk" between the two gondolas made its first appearance. LZ3 "carried on" until 1908, when it was reconstructed and acquired by the Government. Under the name of Z1 it continued work up to the outbreak of the present war, when its movements became obscure. During this time it was again reconstructed in 1911. In 1908 LZ4 was built, and LZ5 started the same year. Both these ships were more or less of the same type, and similar to LZ3. They measured 446 ft. in length and 38 ft. 6 ins. and 43 ft. in diameter respectively. LZ4 was wrecked and burned on August 5th, 1908, and LZ5 was taken over by the Government as Z11 and was destroyed in a storm in 1910. LZ6 was built on the same lines as LZ5, for the Government, but was not accepted until it was reconstructed, with a third engine in the centre, as shown in the illustrations, in 1909. It was destroyed by fire in 1910. In 1910 the first passenger Zeppelin was built, the LZ7, "Deutschland," measuring 148 ft. by 14 ft., and having a central cabin in the "cat-walk." Besides the latter innovation, this ship was the first to have three motors, of 120 h.p. each, installed, and also differed from previous models in having sharper, pointed ends and a single horizontal stabilising surface at the stern. The "Deutschland" was destroyed by a gale in June, 1910, but was replaced by LZ8 the next month. LZ8 was very much the same in general design, but was 7 ft. longer and 3 ft. larger in diameter. This ship also met with disaster, in May, 1911. The next ship, LZ9, was built in 1911 to replace LZ5 (Z2), and was similar in appearance to the second passenger ship, LZ10, "Schwaben," built the same year, but did not possess a central cabin. LZ10 was burnt at Düsseldorf in June, 1912, and was replaced by LZ13, "Hansa." The "Hansa," and LZ11, "Viktoria Luise," which was built towards the end of 1911, were sister ships, and differed from LZ10 in length and in the arrangement of the central cabin (which was more forward) and the tail planes. Then followed a set of ships, LZ12, 15, 16, 17, 19, 20 and 21, during 1912 and 1913, which were all practically of the same type, and with the exception




Schwarz.
1898.
L.Z.1.
1900.
L.Z.3.
1906-7.
L.Z.4 & 5.
1908-9.
L.Z.6.
1909.
L.Z.7.
1910.

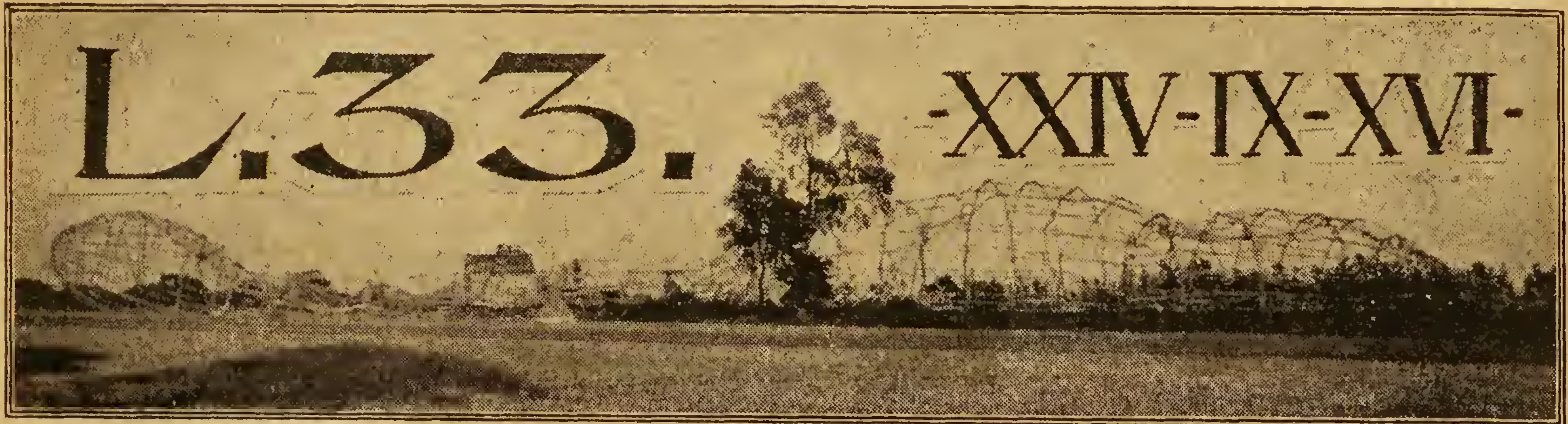
THE EVOLUTION OF THE ZEPPELIN AIRSHIP IN PICTURES.—Part I, from 1900 to 1910. The Schwarz Airship at the top has been included as the source of inspiration to Count Zeppelin.



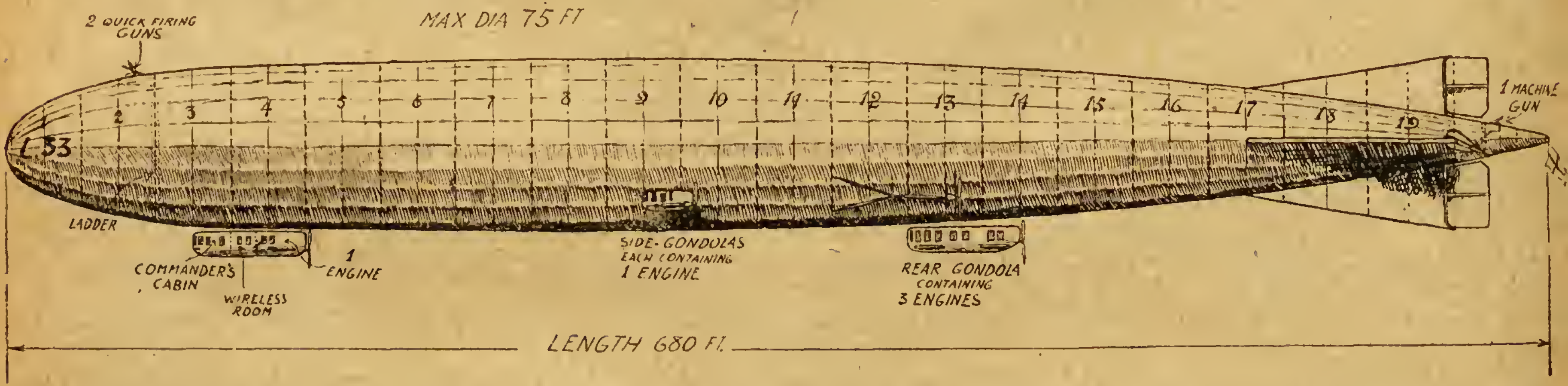
THE EVOLUTION OF THE ZEPPELIN AIRSHIP IN PICTURES.—Part II, from 1910 to the outbreak of war.

of LZ17, "Sachsen," were taken by the Government as Z3, the "Ersatz," 4, 1, 5, 6 and 7 respectively.

There remain but three other types to record, LZ14 (L1), the first naval ship, LZ18 and LZ24, two other naval ships. The former and latter were similar to, but larger than, the "Hansa" type, whilst the LZ18 was peculiar in the absence of the usual "cat-walk." It was by far the largest ship yet built, measuring 518 ft. in length and 54 ft. in diameter. It was destroyed by fire in October, 1913. With the war, further record is in abeyance, but now, through just retribution, we can deal with



It is through the courtesy of the authorities we are able this week to place before our readers illustrations and notes dealing with the Zeppelin airship "L. 33," which, following a raid, was forced, after having attempted to make the return journey, to turn about and steer inland again, there to finally come to grief, as was recorded at the time. How the little cottage seen in some of our photographs escaped damage from fire must for ever remain a mystery (the weatherboards of the former have not even had their paint scorched), the distance from the nearest portion of the wreckage to the walls of the cottage being only a few feet. Although having now remained over a month where she landed, the wreckage of the airship has sagged very little, thanks to the unceasing vigilance of the R.N.A.S., who are constantly at work propping up any portion that appears to be in danger of collapsing, and keeping everything as far as possible in its original shape, until such time as the experts have finished their examination.



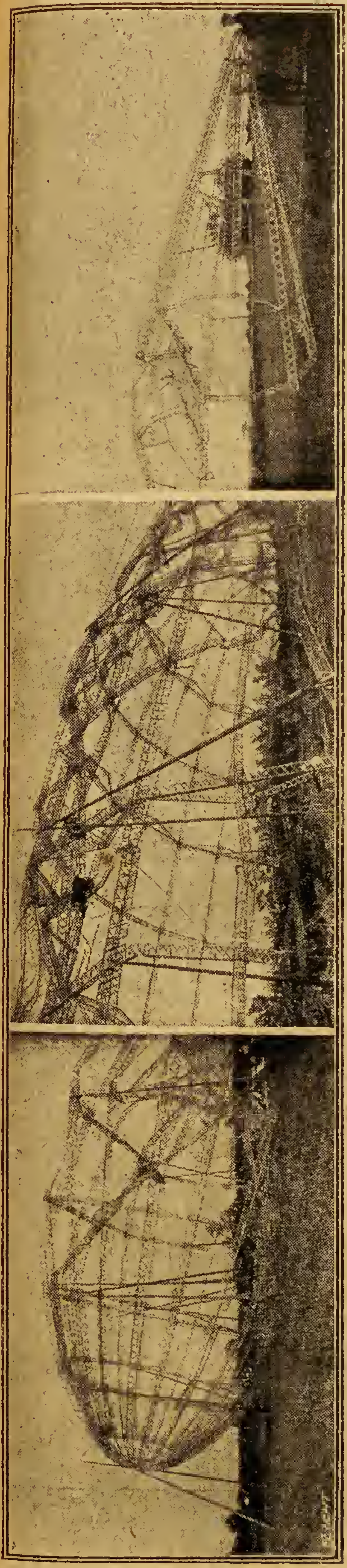
A "RECONSTRUCTION" OF "L. 33."—Although the above drawing does not purport to be an exact scale drawing in detail, it may, generally speaking, be taken to be fairly accurate in proportions. The first thing that impresses one is the striking similarity, in shape and in the distribution of the gondolas, to the Schütte-Lanz airships. Aerodynamically "L. 33" would appear to approach very closely to that type of airship, while retaining the typical Zeppelin construction.

Although the middle portion of the wreck is somewhat badly battered, it has been possible to ascertain with tolerable accuracy the chief dimensions of the airship. Her length overall appears to have been in the neighbourhood of 680 ft., and the maximum diameter about 75 ft. As far as is possible to judge the hydrogen has been contained in 19 ballonnets, the number given in some papers as being 24 being incorrect, and probably arrived at after counting the number of bays in the main hull, which would certainly lead one to guess at a greater number than 19. It appears probable, however, that the rear cells did not contain any ballonnets, the extreme stern forming merely a tailpiece to finish the streamline shape. There were four cars, one near the nose, two about half way, slung from the sides of the main hull, and one some distance further back.

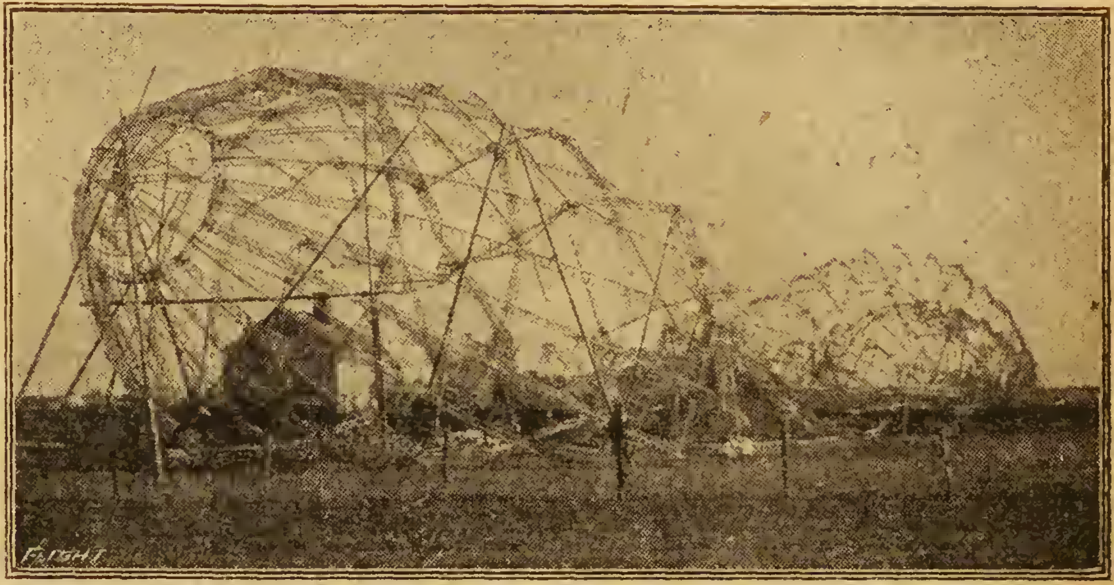
Coming now to the detail construction, it appears better, in order to facilitate reference, to deal with the various items under separate headings. Beginning with the main hull,

The Longitudinal Girders

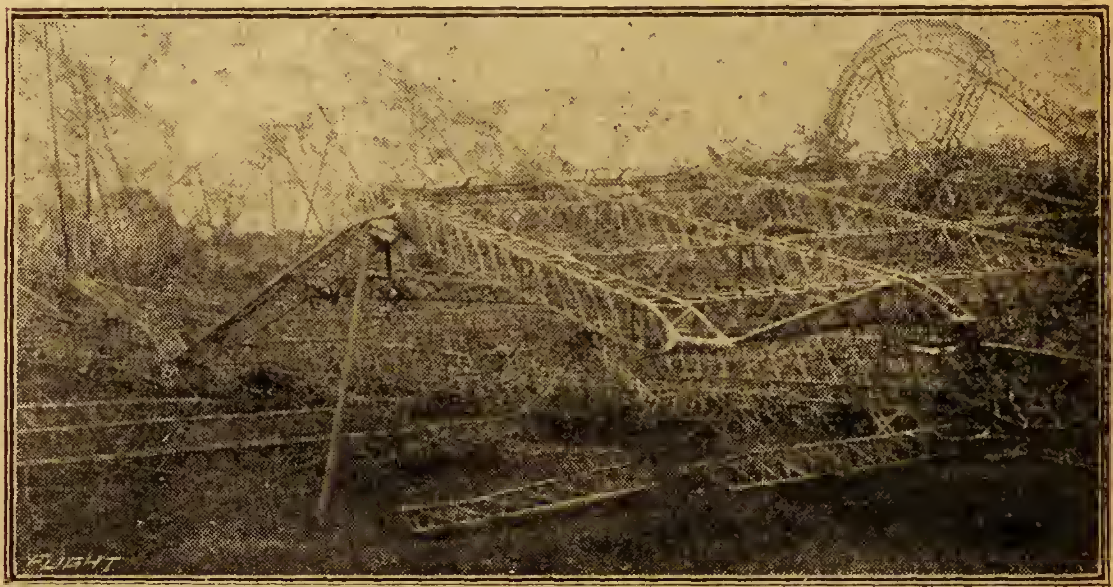
will be dealt with first. These, as, indeed, the whole framework of the airship, are of the lattice girder type, and are all triangular in section. Generally speaking they are in two sizes—the larger measuring across the two sides of the triangle about 15 ins., while the base of the triangle is about 10½ ins. In order probably to standardise as far as possible, it appears that the smaller type of girder has been so proportioned that its sides are the same dimensions as the base of the larger girder, its base being about 8 ins. Each girder is built up of three corner rails—18-gauge in the larger girder and 20-gauge in the smaller—connected by the riveted crosses illustrated in our description of the relics at the H.A.C. These crosses are 23-gauge in the smaller girder, and about 22-gauge in the larger. There are 13 of the larger



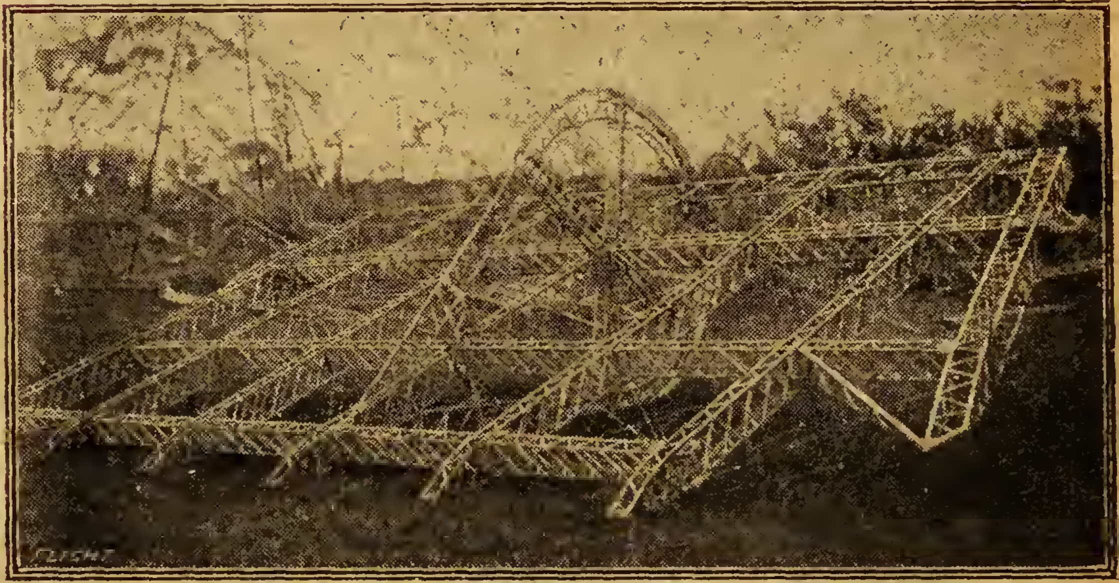
"L. 33" WRECKAGE.—Views of the aluminium framework as now lying on the ground. On the left is seen the side of the nose of the airship, in the centre is a portion of the main framework (in this, near the top, can be seen some of the gas valves of the ballonnets), and on the right is the framework of the extreme tail of the airship. In this photo., in the top left-hand corner, can be seen the platform on which the rear top gun is mounted.



General view of the wreck of "L. 33," looking towards the stern.



The upper half of the rudder, and the vertical top fin, fallen over on their side.

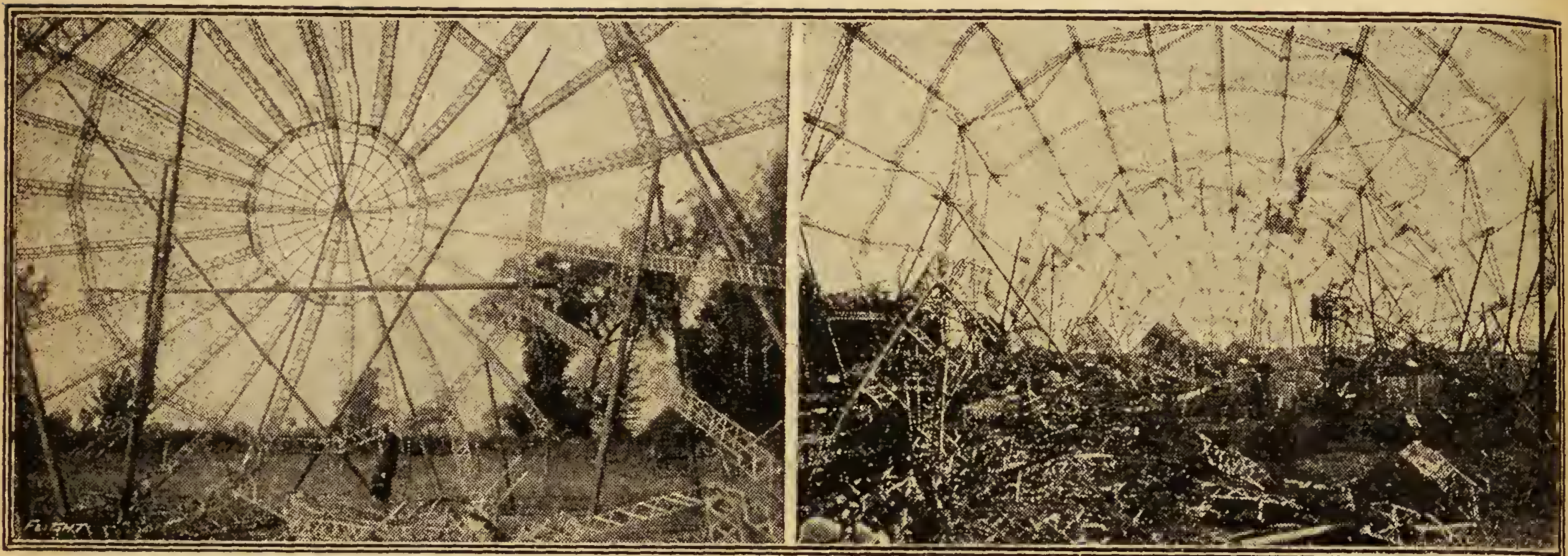


One of the elevators; the curved structure is the quadrant over which the control cables passed.

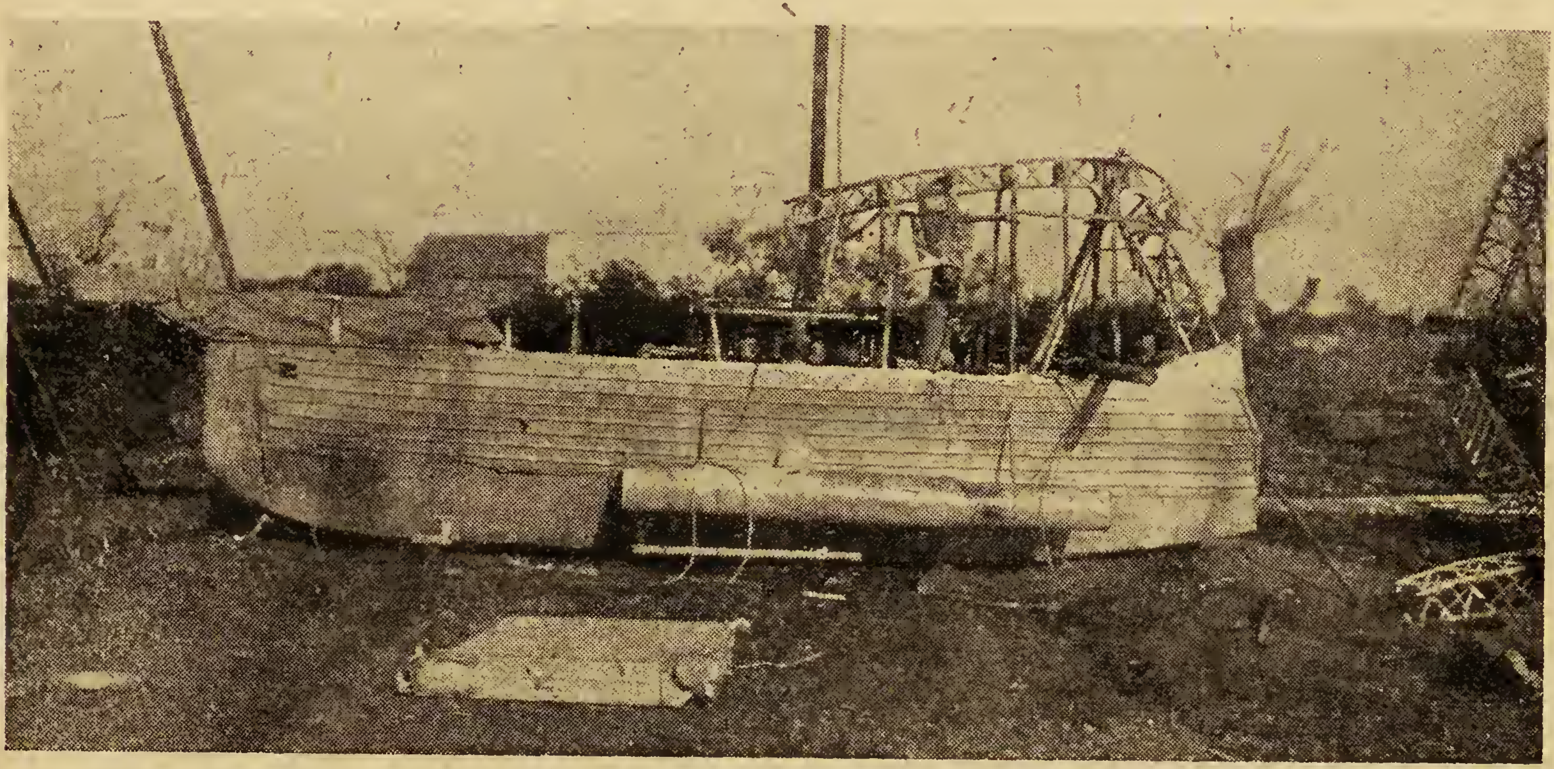
girders and 12 of the smaller ones, giving a polygonal section with 25 sides. Of the larger girders only five run right through to the extreme nose as complete girders. Of these, two are placed at the bottom—one on each side—and one on the top. The other girders do not run right through *as girders*, their outer corner rail only being carried through to the nose. Reference to the photographs will show the construction.

The Polygonal Girders

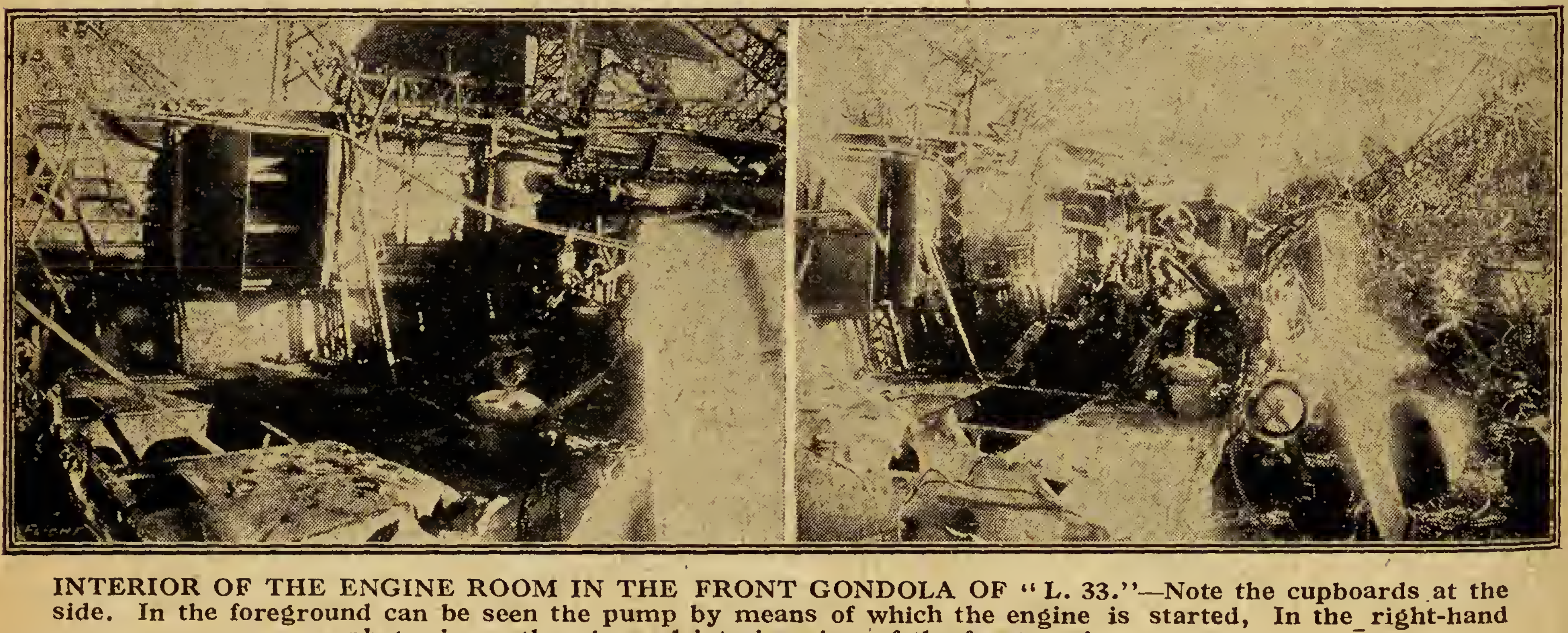
are also of two types. These differ in shape only, the size being the same for the two types. They are of triangular section like the



View of "L. 33" framework from inside of the bow of the airship.—On the right the view is from inside looking towards the stern.

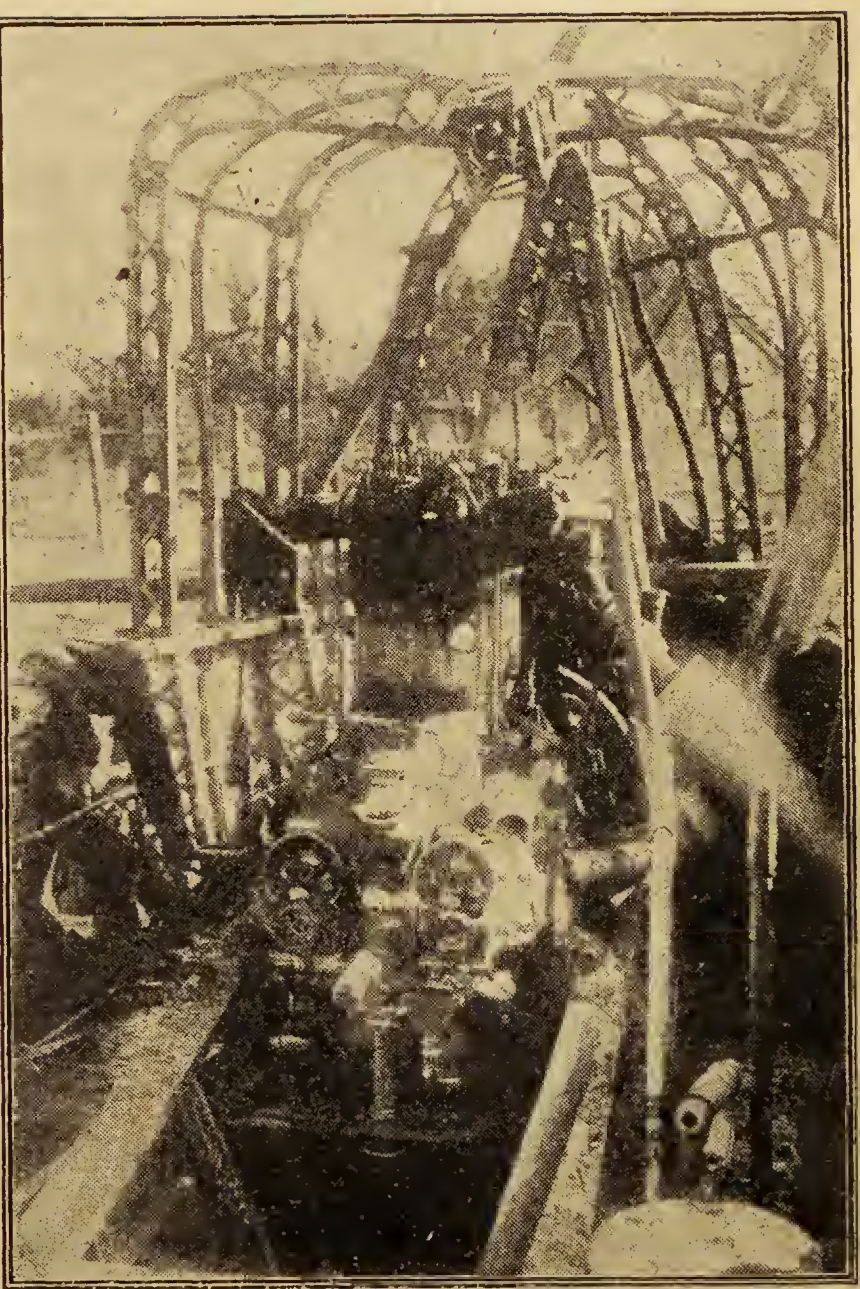


THE PORT SIDE GONDOLA OF "L. 33."—A portion of the superstructure has been cut away. Originally it extended along the whole length of the gondola, windows being fitted at intervals. Near the bow can be seen the gun pivot.

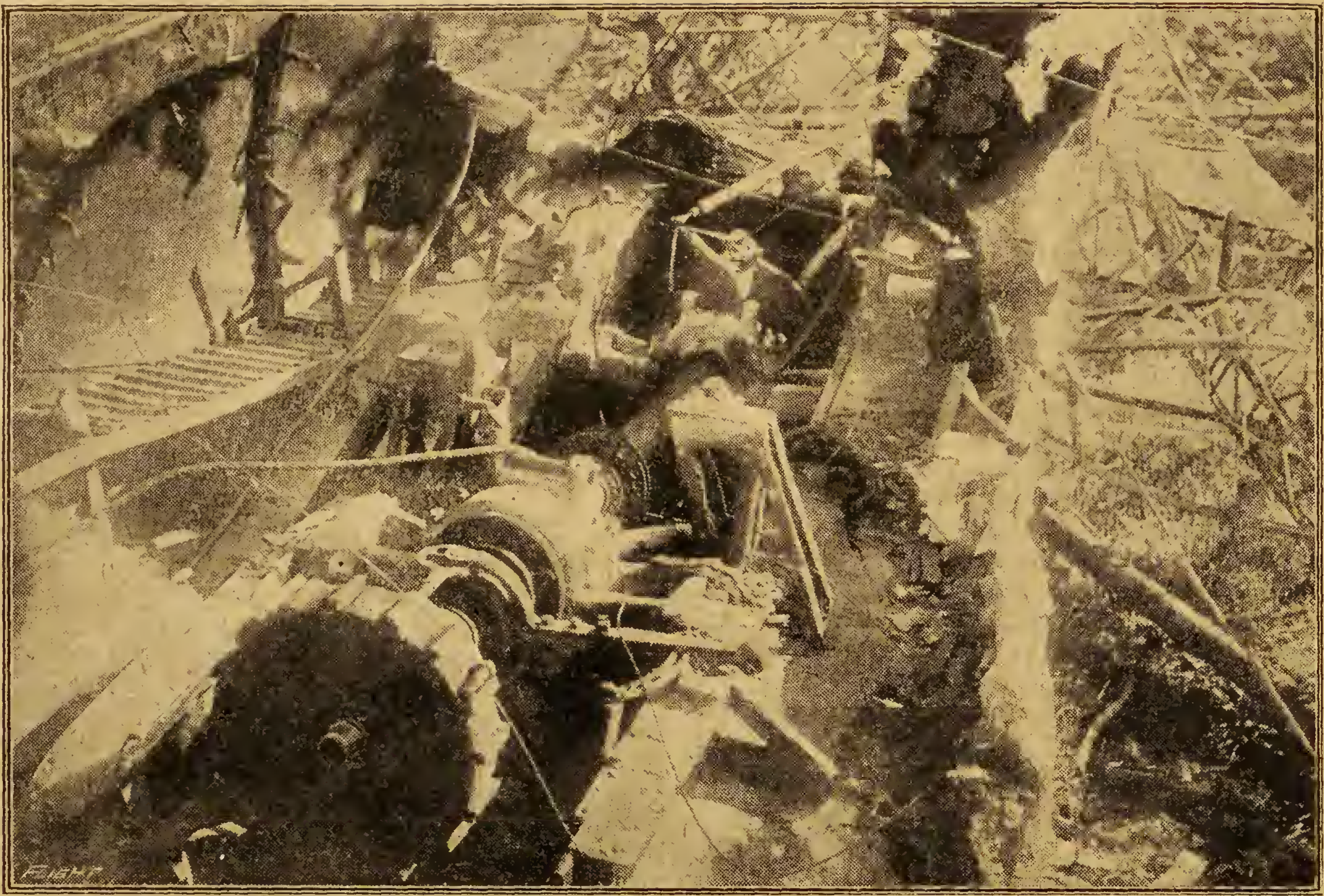


INTERIOR OF THE ENGINE ROOM IN THE FRONT GONDOLA OF "L. 33."—Note the cupboards at the side. In the foreground can be seen the pump by means of which the engine is started, In the right-hand photo. is another general interior view of the front engine room.

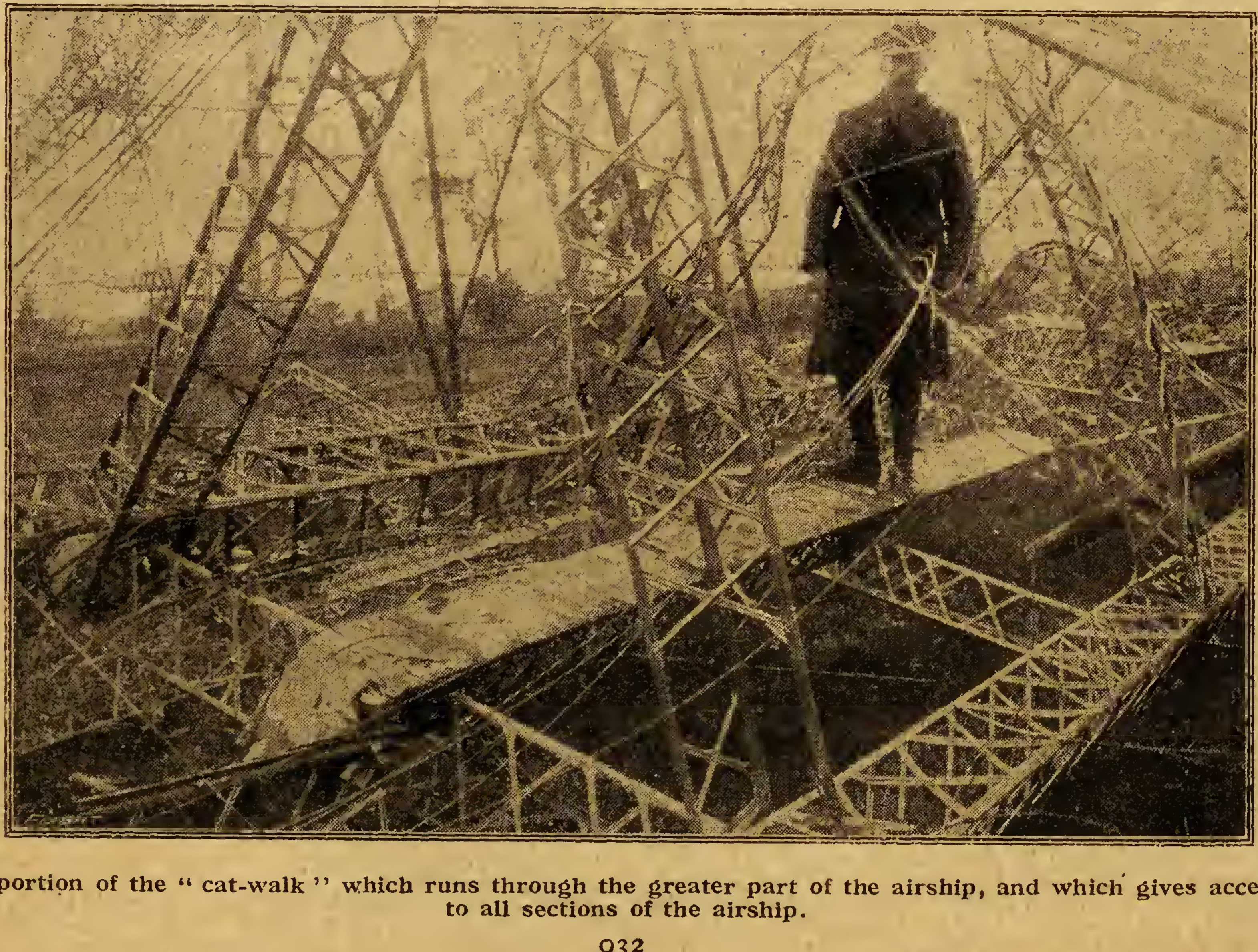
longitudinal girders, and braced with the now familiar crosses. The one type has 25 sides, conforming thus to the general section of the airship, while the other has only 13. The latter type is joined with its corners to the larger of the longitudinal girders, the smaller being carried on a kingpost projecting a short distance outside the flat side of the polygon in order to bring it into line with the corresponding corner of the 25-sided polygon. The principle is difficult to explain adequately in writing, but will, we think, be easily understood by reference to the accompanying illustrations. It was mentioned that it was difficult to arrive at the number of ballonnets from counting the number of cells. This is partly due to the fact that each ballonnet extends through two cells. The polygon which has the kingpost bracing occurs between adjoining ballonnets, while the 25-sided polygon is on the lateral centre line of the ballonnet. Some of the joints connecting longitudinal and polygonal girders, and in some instances several others, are very intricate indeed, and must have required great skill in designing. By way of illustration we publish a photograph of one such joint where five girders meet, and where, moreover, some of the cables from which a car is suspended are attached. The anchorage for this cable is a casting, while all the other intricate network is lattice girder. In the larger longitudinal girders the spacing of the bracing crosses is not uniform, the portions occurring at the point of attachment to the polygonal girders having their crosses spaced closer together, so that the ends of adjoining crosses overlap one another. The whole structure is rendered rigid by a system of wire bracing, the rectangles formed by two longitudinal and two polygonal girders being diagonally braced, but the wires not fitted with wire strainers. A long heavy cable runs through from nose to stern through the centre of all the polygons, and to this cable run wires from the corners of the polygons between the ballonnets. The central cable is fitted with tightening arrangements, which, in turn, tightens the radial wires.


Interior view of the Port Side Gondola of "L. 33." The large tube sloping downward from the engine is the exhaust pipe carrying the burnt gases to a silencer placed externally on the side of the gondola. The tube sloping upwards and outwards from the engine carries away the fumes and hot air from the crank cases.

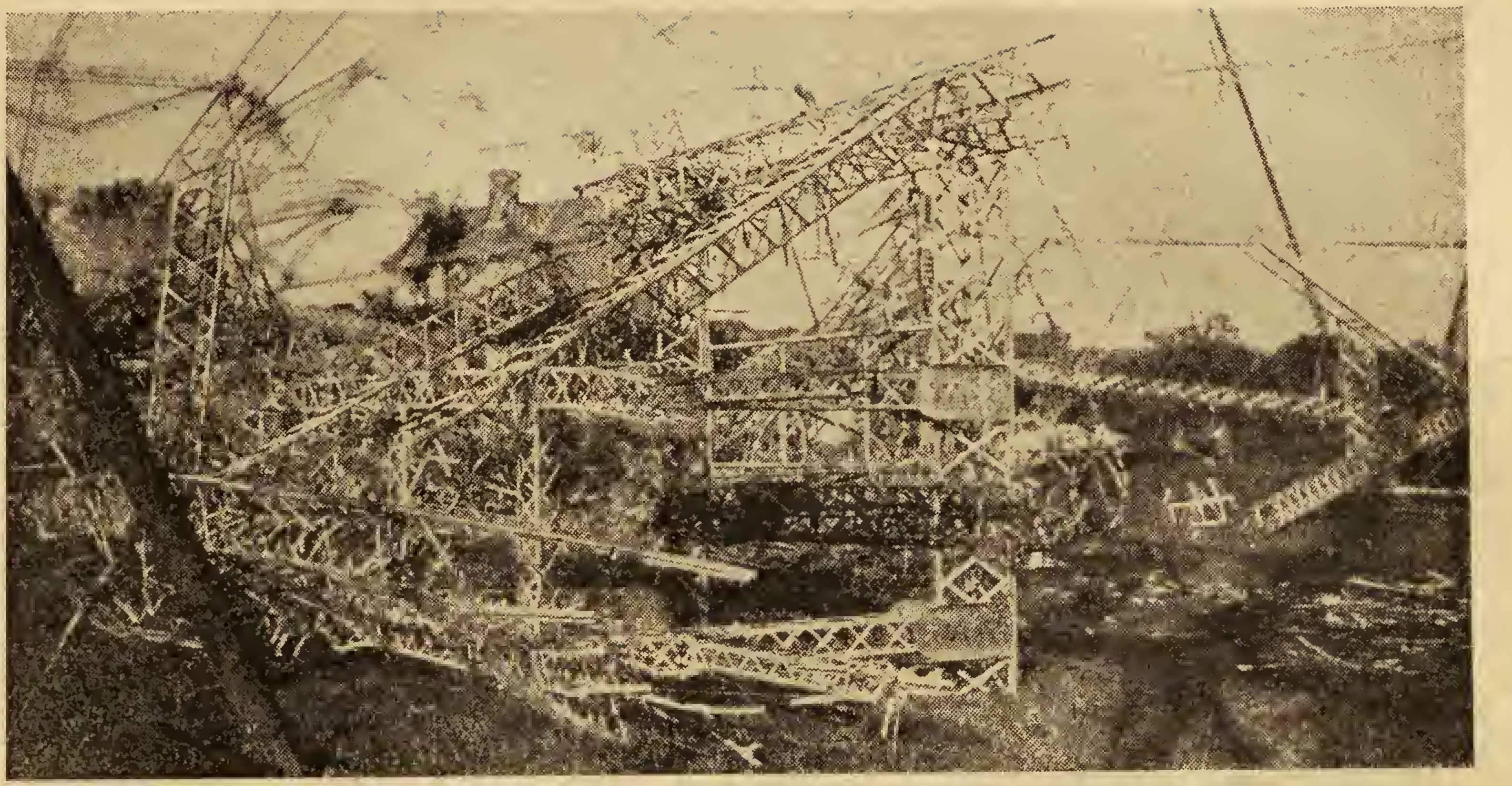
Two engines standing side by side in the rear gondola of "L. 33," which has been somewhat severely "strafed."



CLUTCH AND PROPELLER-SHAFT OF THE REARMOST ENGINE IN THE REAR GONDOLA OF "L. 33."—This engine had been removed when the photograph was taken, but the two other engines, placed side by side in the same gondola, were still in place, as seen in one of our other photographs.



A portion of the "cat-walk" which runs through the greater part of the airship, and which gives access to all sections of the airship.



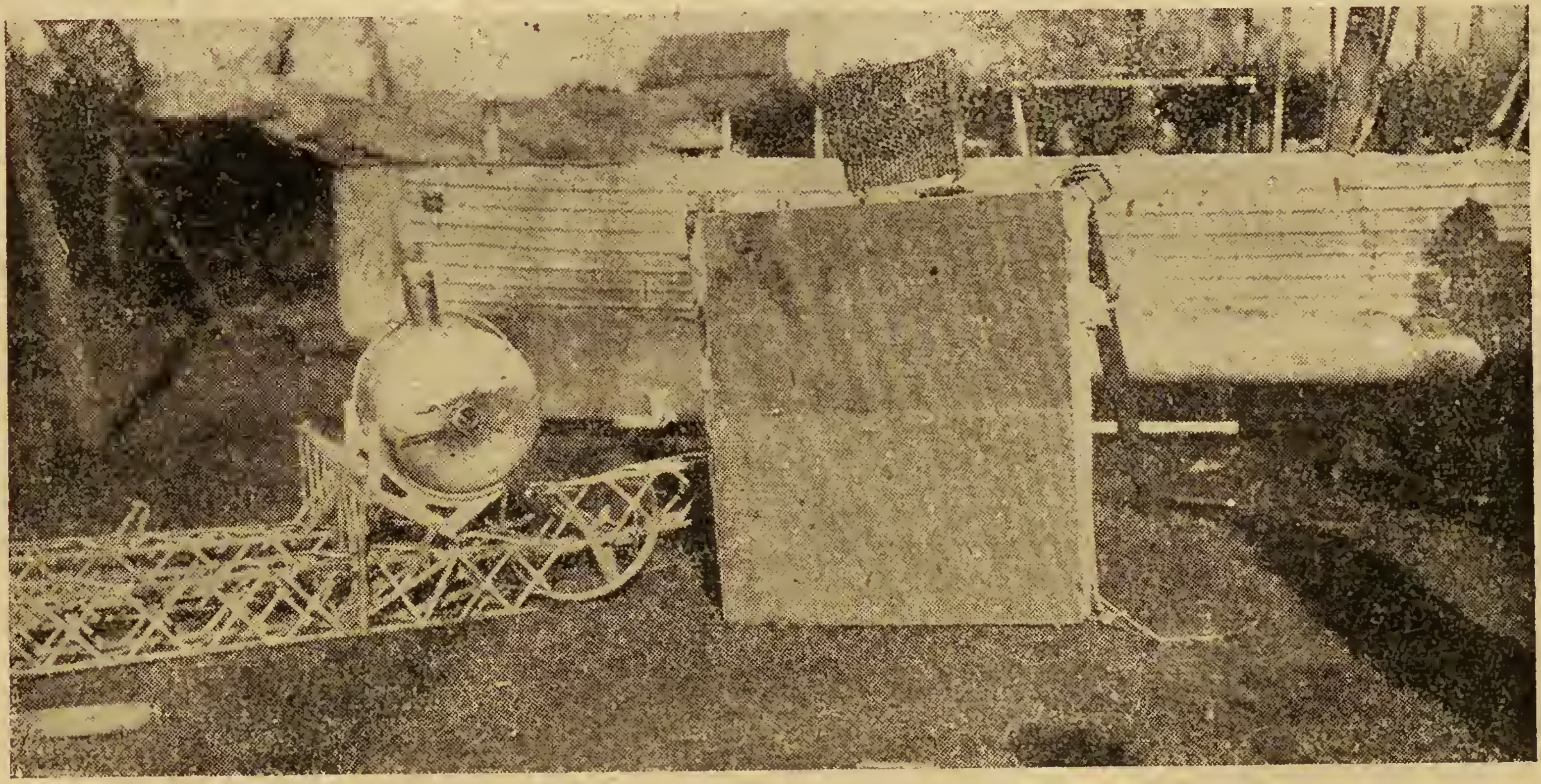
PORTION OF THE BOMB CHAMBER OF "L. 33."—In the photograph it is seen lying on its side. The bombs are suspended in two rows, one each side of the "cat-walk." The rectangular perforated plates are guards which prevent the bombs from catching in the framework.

The Ballonnets,

of which, as we have already pointed out, there are 19, are apparently made of some finely woven cotton fabric and doped to make them gastight. They are secured to the girder framework by a cord netting of about 15-in. mesh, which surrounds them. A strange thing in connection with this netting is that a great quantity is still dangling from the top girders, having in some mysterious fashion survived the intense heat of the burning gas. Each ballonnet is fitted with gas valves, of which some can be seen in one of our photographs. Apparently arrangements had been provided for maintaining and equalising the pressure in the ballonnets, but so far as we were able to ascertain no cylinders with compressed hydrogen for replenishment were found in the wreck.

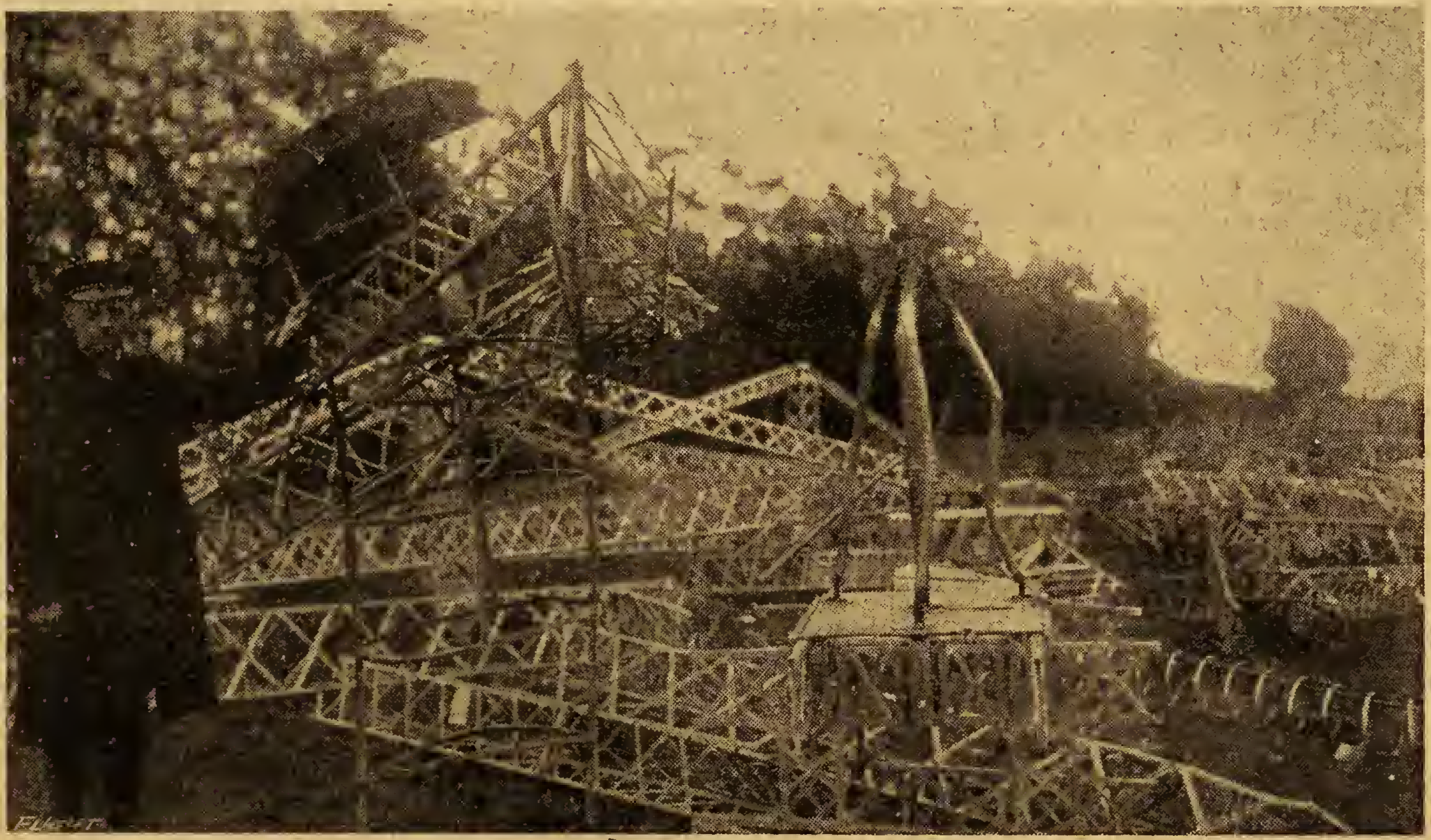
Power Plant and Transmission.

The six engines with which the "L. 33" was equipped were housed in four gondolas—one in the front, one in each of the side gondolas, and three in the rear gondola. They were all of the same type as those exhibited at the H.A.C., and probably developed some 240 or 250 h.p. each. The engine in the front gondola, drives a single two-bladed propeller through



SOME NECESSARY ACCESSORIES OF "L. 33."—One of the radiators and its water tank. On top of the radiator is seen a smaller radiator, which is used for cooling the lubricating oil. The large radiator is fitted with a by-pass arrangement, so that the flow of water can be regulated according to the temperature at the different altitudes.

a clutch and reduction gearing. Each of the engines in the side gondolas drives a similar propeller, while the disposition of the engines is slightly different in the rear gondola. Here there are two engines placed side by side in front, each driving through bevel gearing a propeller placed on "A" shaped outriggers some distance up and out from the side of the main hull, while in the rear of the gondola is another engine driving a single propeller immediately behind the stern of the gondola, as in the case of the other gondolas. Each of the engines was fitted with a pump which can be seen in some of the accompanying photographs. This pump is so arranged that it draws in a mixture of petrol and air, and, on the return stroke, forces the mixture into the cylinders of the engine. When the cylinders have received their charge of gas in this manner the engines are started by means of a hand operated Bosch magneto, similar to those used on the majority of German aeroplanes. In the front gondola are found several cupboards which evidently contained the food supplies for the crew.



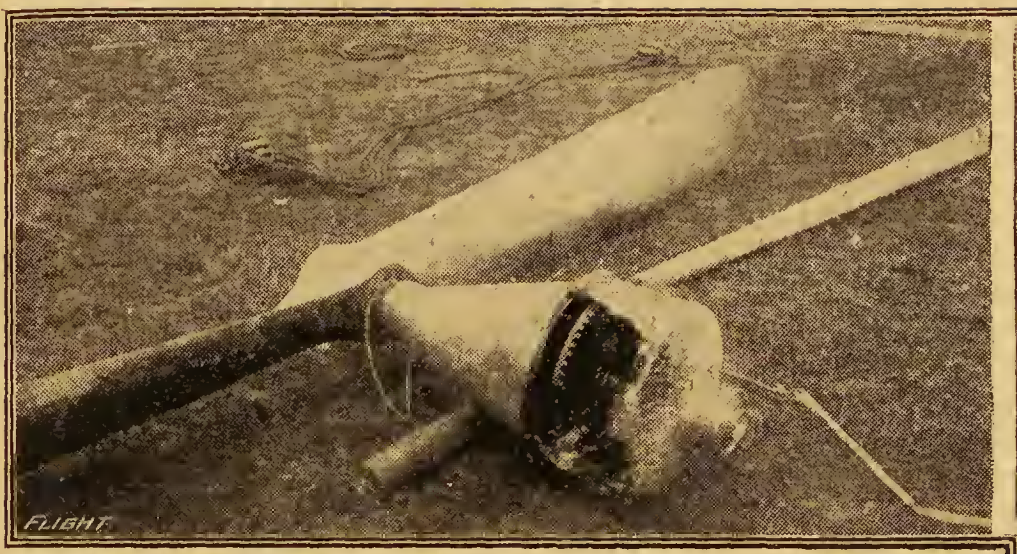
THE VENTILATION OF "L.33."—On the left can be seen one of the ventilating shafts which carry away the gases, and thus render possible the mounting of guns on the top of the airship at both ends, It terminates in a hood projecting beyond the envelope. On the right is seen the tripod mounting of one of the quick-firing guns.

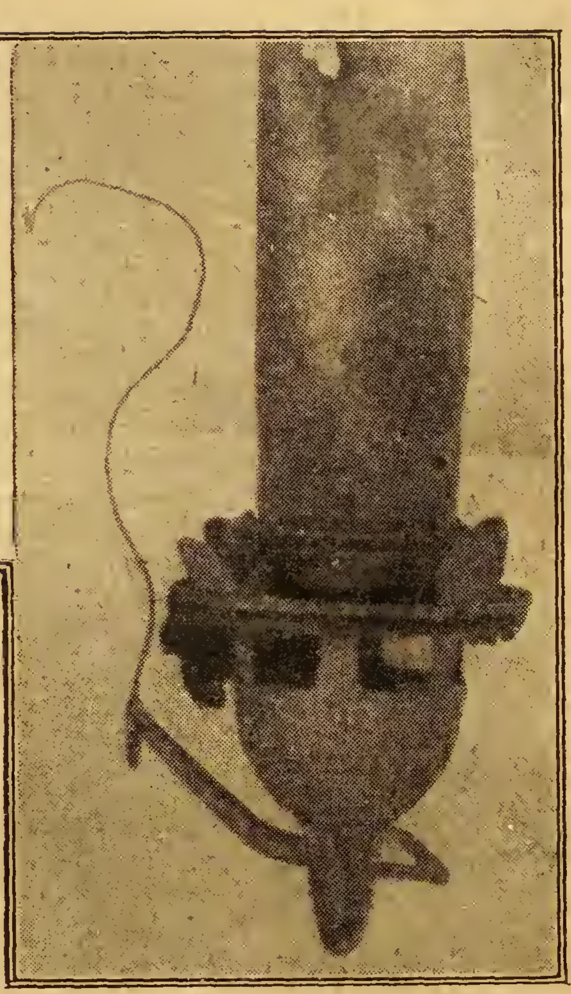
Propellers.

With the general disposition of these we have already dealt. In the case of the front and side gondolas they are placed immediately behind the stern of the gondola, while in regard to those driven from the rear gondola two are placed on outriggers from the sides of the airship, while the third is just behind the stern of the gondola. The mounting of the side propellers is by means of streamline tubes, two pairs, each of which forms an "A," supporting a propeller, one being placed in front of the gear box and one behind it. Thrust ball bearings are provided inside the bevel gear casing, and the thrust is transmitted to the framework of the main hull through a "Y" shaped structure some 50 ft. in length, of which the single arm is secured to the front end of the bevel gear casing, while the forked arms are joined to points on the longitudinal girders of the hull. The construction of this "Y" structure was very pretty, each of the three arms being made up of two very elongated cones welded together in the centre, and each welded along one side. Incidentally these tubes had a fair amount of riveting in them, which at first sight looks somewhat puzzling after the tubes have been closed up, but of course, after thinking it over, various ways suggest themselves in which the riveting could have been carried out. The propellers all appeared to be very similar to those already known to many of our readers through visits to the H.A.C. They were on an average about 17 ft. 6 ins. diameter, and presented nothing particularly interesting either in shape or construction.

The Control Surfaces.

Another respect in which the "L. 33" was reminiscent of Schütte-Lanz practice was in the arrangement of the tail planes. These were, as nearly as it was possible to judge, symmetrical, the upper and lower fins and rudders being exactly similar, and of the same shape and size as the fixed tail plane and elevator. Rudder as well as elevator were divided to leave room for the conical tail-piece, which projected some distance behind their trailing edges. Constructionally the control surfaces were different from the construction of the hull in that they were built up of rectangular instead of triangular section girders. The control cables passed over quadrants fitted with a groove around their circular portion into which the cables fitted when the movable flap was turned out of the neutral position. Both rudder and elevator were pivoted some distance behind their leading edge, ball bearings being employed.

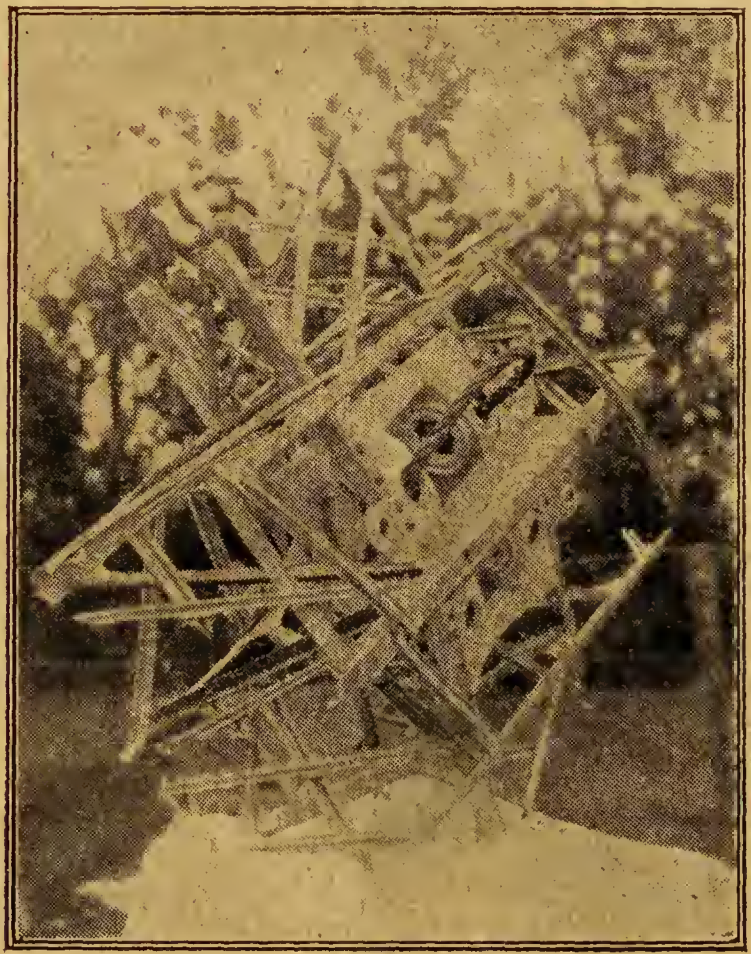




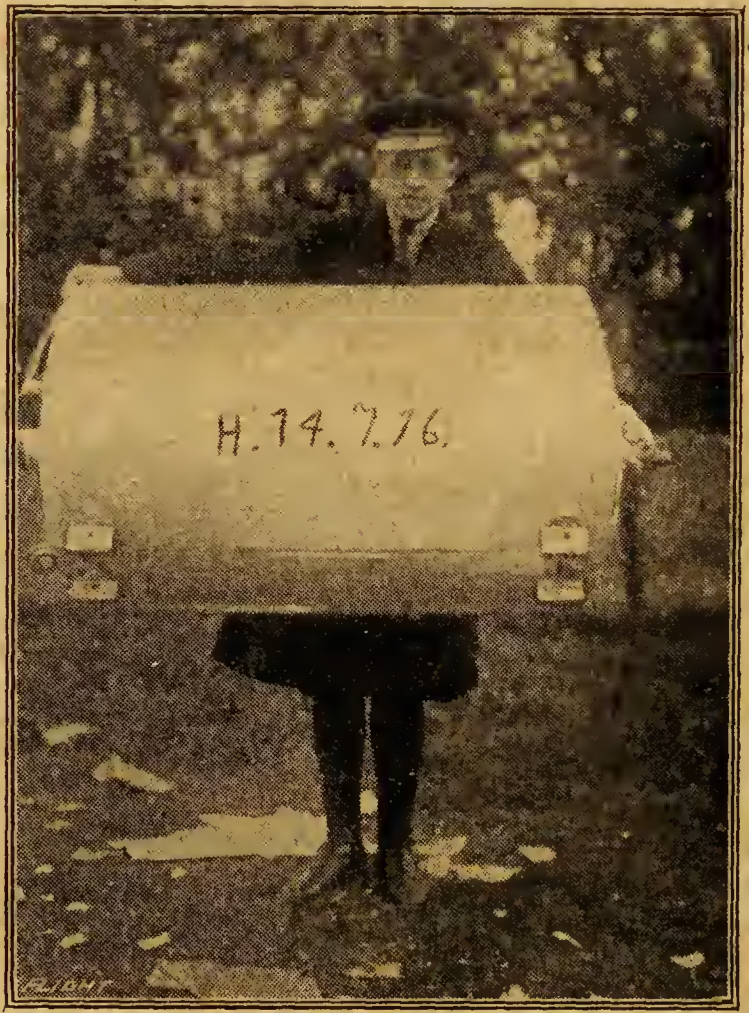
One of the side propellers of "L. 33," with its bevel drive. The damage to the casing is believed to have been caused by our anti-aircraft guns, and may have been in no small measure contributory to the bringing down of the airship, as one of the propeller shafts was found some three miles away from the spot where the airship came to grief. In the right-hand photo. is seen a water ballast release valve.

The Gondolas.

Constructionally the gondolas were built up of a framework very similar to that employed in the construction of the tail planes, *i.e.*, rectangular girders braced with crosses. The lower portion of the gondolas was covered with sheet metal, corrugated in a special way, while their upper part had a girder framework over which was stretched stout fabric, windows of non-inflammable celluloid occurring at intervals. These windows had been fitted with blinds so that it was possible to have the interior well lighted without risking detection. The front gondola was divided into three compartments, the front one of which was the Commander's station, from where he directed the navigation and the bomb-dropping.



A highly ingenious and very complicated joint in "L. 33," where a number of girders running in different directions meet.



ONE OF THE PETROL TANKS OF "L. 33."—It has a capacity of 78 gallons and weighs only 26 lbs. Note the date, "14.7.16."

In front of him he had the engine room telegraph, switchboard, the various indicators showing the pressure in the ballonnets, navigation instruments, &c. On a switchboard were a series of little electric lamps in three colours, red, white and green. When the red light was burning this probably indicated that the trap door in the bomb chamber was closed and that therefore no bombs must be dropped. When the green light was shown this indicated that the trap door was open and that all was in readiness for the corresponding bomb to be released, while the white light was in all probability an indication that the bomb had been dropped.

Behind the commander's cabin was a much smaller one in which had been installed the wireless. This room was separated from the engine room behind it by an air space of a couple of inches, and cotton wool packing was employed to keep out as far as possible the noise from the engines. It is evident that the range of the wireless set carried was comparatively great,

The engine room behind the wireless cabin has already been dealt with, and the side-gondolas will now receive our attention. These were placed some distance up and out from the side of the hull, and had apparently been suspended on stranded cable, while being suitably strutted with streamline struts to give the necessary rigidity. Beyond an engine in the rear portion driving a single propeller, thus incidentally rendering their propellers virtually side propellers, these gondolas contained little of special interest, while the rear gondola was chiefly remarkable for the fact that it contained three engines, two side by side in front and one in the stern. Communication between the various gondolas, gun platforms, &c., was by means of a "cat-walk," a narrow passage running through the greater part of the bottom of the airship. It was, of course, enclosed by the envelope, but only a narrow foot-board some 9 ins. wide provided any foothold. For some distance it ran through the bomb chambers, while near the front and stern it communicated with the ladders leading up to the gun platforms on top of the airship. The "cat-walk," as well as other parts of the airship, were ventilated by tubular shafts running up to the top of the envelope and terminating here in a form of hood or scoop made of three-ply-wood.

Armament.

Some 60 bombs appear to have been carried, slung from two longitudinal girders, one on each side of the "cat-walk." Under each batch of bombs was a trap door, opened by means of cables passing over pulleys, from the Commander's cabin. At the end of each compartment was a plate or scoop the object of which was evidently to prevent the dropping bomb from catching in any part of the lattice girder, and that they had effectively done so on more than one occasion was evident from the number of scratches on them. The bombs were slung on hooks operated by solenoids from the switchboard in the Commander's cabin.

As regards guns, it appears that nine were carried. Of these the two largest were mounted on tripods side by side on the platform on the roof near the nose of the airship. The tripods were collapsible, so that when the guns were not in use they could be folded down flat and the trap door in the roof closed so as to offer no extra air resistance. A smaller machine gun was mounted on a small platform near the pointed stern. This platform was approximately in line with the trailing edge of the elevator and rudder, so that a good range of fire was obtained. It appears that two more machine guns were mounted in the engine room of the front gondola, one on each side projecting through one of the windows, while the side-gondolas had one machine gun each, the mounting for that on the port side being clearly visible in one of our photographs. These side-gondolas, by the way, were fitted with port lights in the approved naval fashion, that on the port side showing a red light, while the starboard had a green one. In the rear gondola were two more guns, one each side, so that it will be seen that it is by no means easy to approach one of the latest Zeppelins from any quarter without being within the range of several guns. All the more credit to our Zepp. "strafers."

The Ballast

appears to have been in the form of water, contained in tanks mounted in the bottom of the hull. Arrangements have probably been provided for pumping the water from one tank into another, and the valve by means of which the water was released is illustrated in one of our photographs. In addition to the water ballast means were provided, we understand, for equalising the height of fuel in the petrol tanks, thus further tending to enable the trim of the airship to be maintained

Without actual measurements it is impossible to say what the cubic capacity of the "L. 33" was, but it will probably be found to approach to the 2,000,000 cubic ft. Her speed, with six engines aggregating some 1,500-h.p., was in all probability in the neighbourhood of 60 m.p.h.

Fatal Accidents.

Second Lieut. F. R. Lucas, R.F.C., was killed in Sussex on October 20th through his biplane crashing to the ground. It was stated at the inquest that he was making his first cross-country flight.

Flight Sub-Lieut. A. R. Greenwall died on October 20th from injuries received in Lincolnshire on the previous day.

Lieut. R. C. Vernon-Inkpen, Royal Warwick and R.F.C., was accidentally killed on October 21st.

Through an accident on October 23rd a flying officer was injured and an air mechanic killed.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A Special Meeting of The Committee was held on Monday, the 23rd inst., when there were present: Prof. A. K. Huntington, in the Chair; Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Flight-Commander C. F. Pollock, R.N., and the Assistant Secretary.

Election of Members.—The following New Members were elected :—

Ernest Barningham.
Second Lieut. Anthony Fraser Harris Blenkiron, R.F.C.
Gerald Alston Harrison.
Lieut. Thomas Butler Lloyd, R.N.V.R.
Sub-Lieut. George Horsley Porter, R.N.V.R.

Suspension of Entrance Fees of New Service Members.

On the motion of the Chairman, it was unanimously resolved :—

"That on and after the 1st November, 1916, until further notice, Service Members be elected without Entrance Fee."

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to Oct. 17th, 1916..	10,863	19	1
Employés of Ruston, Proctor and Co., Aircraft Works (Twelfth contribution)	1	10	0
Collected at the Westland Aircraft Works, Yeovil (Fifty-third contribution)	0	17	5
Total, October 24th, 1916	10,866	6	6

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

AN ECHO FROM A BAVARIAN PRISONER OF WAR CAMP.

The following very interesting letter has been received from Capt. Thomas Chaloner, 13 Squadron, R.F.C., who was captured on July 1st, 1916, while on a bombing raid. It is addressed to his sister, Miss Cynthia Chaloner, and dated August 8th, 1916, from Kriegsgefangenenlager, Feste Rosenberg, Rosenberg b. Kronach, Bavaria :—

"My Dear,—Many thanks; I was delighted to get yours and Dodo's letters, the first I have had from England.

"I am still in the dark as to what letters of mine you have received so far. In case you have not received them I should like all sorts of foods sent out here—porridge, sausages, egg powders, 'Ideal' milk cream and ham. There is a very good loaf of bread which some of the officers here are getting. The address is, R. Winter, Ltd., Birmingham. It is a good, heavy, stoggy bread, and stands the journey well. You need not be afraid of sending too much at first.

"Your solution of my disappearance was not quite correct. I did not see the thunderstorm or whatever it was, but was engaged by a German at the moment I spotted it coming up, but got away from him, only to meet another about 4 miles further on. He potted at me from about 200 ft. above me for quite a long time before I realised he was firing at me. I thought he was engaging another machine. When I looked up I saw he and I were the only machines in sight, so I realised what was up.

"My realisation was strengthened a moment later when I heard pat, pat, pat, on my left plane, and saw three neat little holes in the plane. I fired a drum at him, having to stand on my tail to do so. He then went ahead of me—I should say he was twice as fast as I was—and came down level with me. I got off half a drum at him then, but he was too far off to be accurate. He then climbed and came over the top of me.

"As far as I could see afterwards he only got one shot into the machine besides the first three, and that hit something on the back of my engine, probably the carburettor. Anyhow my engine cut out and I started to glide. He then followed me down, firing occasional bursts at me, at 5,000 ft. I turned on him again, but having no engine could not keep on him long enough, and only got off 15 rounds or so. My machine made a glorious dive and side-slipped, coming out at about 180 ft. I then landed and was taken prisoner by some infantry, who took me about 10 miles back towards the firing line. Finally, the German Flying Corps sent two officers in a car to rescue me. After a lot of scrapping they got the better of the German Infantry Staff, who claimed me as their prisoner, and brought me back.

"They then took me back to their mess, where they gave me a very good dinner. The man who had got me down was there, too, and his observer also (the fellow who got poor Monkton, who was in my squadron). Apparently they got 15 machines down that day, 11 of ours and four French.

"They were very nice and took me back to my machine, as I wanted to get my coat and also find out where I had been hit. It was amusing meeting some of those who had the luck to get captured unwounded. Several of them had their shaving kits with them, as we all looked on it as a question of merely whether we should be captured dead or alive. Just as I was crossing the line I met a Morane machine of ours, and he followed me for a few minutes. Then I met a Hun, and looked round for him—the Morane—but he was nowhere to be seen; where he had got to I cannot imagine. I got rid of this machine by going over an anti-aircraft gun which I had seen firing from a town behind the lines. As soon as they started firing at me he left me, and I presume went back to the lines on some job or other.

"Well, this is six pages, so I must stop now. Anyhow, I have little or nothing to write about. "Yours,

"Tim."

Once again it emerges from Capt. Chaloner's letter that there is distinct sympathy between the Flying Services of friend and foe of both sides. The reference to the "stoggy bread" of R. Winter, Ltd., Birmingham, is a pretty good hint to senders of parcels to Germany other than to Capt. Chaloner. No doubt the "Winter" bread is a specimen of the sound home-made article, which retains its sweetness long after most bakers' bread becomes uneatable.

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A Zeppelin Bomb on Holland.

Considerable indignation has been aroused in Holland by the manœuvring of a Zeppelin at a low altitude, and especially by the dropping of a bomb between Gorinchem and Hoogblockland. According to the *Dordrecht Courant*, the missile was a petrol tin, but Mr. Leonard Spray, of the *Daily Telegraph*, in a despatch from Rotterdam, says that it was an incendiary bomb 19½ ins. in diameter, and that it made a hole in the road 2 yards in diameter and rooted up some trees.

A Fleet of Zeppelins Over Norway.

Eight Zeppelins are reported to have passed over Hinna, a mile from Stavanger, according to a message from Christiania to the *National Tidende* on Monday.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Accidentally Killed.

Flight-Lieut. L. H. Hardstaff, R.N.

Died of Injuries.

Proby. Flight-Sub-Lieut. A. E. Greenwell, R.N.

Severely Injured.

Sqdn.-Com. R. L. G. Marix, D.S.O., R.N.

Injured.

Proby. Flight-Sub-Lieut. G. G. Bowman, R.N.

Slightly Injured.

Flight-Sub-Lieut. R. J. M. de St. Leger, R.N.

Prisoners of War in Germany.

Flight-Sub-Lieut. C. H. S. Butterworth, R.N.
Flight-Sub-Lieut. C. D. Newman, R.N.
Flight-Sub-Lieut. J. S. N. Rockey, R.N.

Reported by the War Office:—

Killed.

Capt. R. N. Adams, R. Fus. and R.F.C.
Lieut. E. M. Carre, Lincs., attd. R.F.C.
2nd Lieut. L. C. Kidd, R.F.C.
2nd Lieut. F. E. S. Phillips, Devon R. and R.F.C.

Previously reported Missing, now reported Killed.

2nd Lieut. E. D. Steytler, S. Lancs., attd. R.F.C.

Correction.

Lieut. N. A. Browning-Paterson, R.A. and R.F.A., should read

Capt. N. A. Browning-Paterson.

Died.

Lieut. S. Woodrow, Australian Flying Corps.
1147 1st Air-Mech. A. C. Wilson, R.F.C.

Died of Wounds.

8651 2nd Air-Mech. A. Chadwick, R.F.C.

Wounded.

2nd Lieut. F. M. Corry, Shcr. Foresters and R.F.C.
2nd Lieut. C. K. M. Douglas, R.F.C.
Capt. T. R. Duff, Argyll and Suth. H. and R.F.C.
2nd Lieut. R. V. Franklin, R.F.C.
2nd Lieut. W. M. Kent, R.F.C.
2nd Lieut. W. E. Nixon, K.O. Sco. Bor. and R.F.C.
2nd Lieut. S. M. Smith, London and R.F.C.

Missing.

Lieut. A. H. M. Copeland, Can. A.S.C., attd. R.F.C.
2nd Lieut. A. R. Crisp, R.F.C.
2nd Lieut. M. Hayne, Lancs. Fus. and R.F.C.
2nd Lieut. F. M. Lawledge, R.E., attd. R.F.C.
Lieut. J. B. Lawton, Buffs. (E. Kent) and R.F.C.
2nd Lieut. N. Middlebrook, Rifle Brig. and R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. A. Douglas, R.F.A. and R.F.C.
Capt. D. B. Gray, Infantry, attd. R.F.C.
2nd Lieut. V. F. H. Hugill, R. Fus. attd. R.F.C.
2nd Lieut. F. G. Macintosh, R.F.C.
Lieut. V. G. Odling, R. Berks., attd. R.F.C.
2nd Lieut. E. H. Wingfield, R.F.C.

Previously reported believed Taken Prisoners at Kut-el-Amara, now reported Prisoners of War.

7373 2nd Air-Mech. R. G. Nickolls, R.F.C.
7870 2nd Air-Mech. S. J. Wells, R.F.C.

Believed Taken Prisoner at Kut-el-Amara.

3388 2nd Air-Mech. W. Fairhead.

THE "X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 52" Raid, October 22nd.

The following *communiqué* was issued by the Field-Marshal, Commanding-in-Chief, Home Forces, on October 22nd, 4 p.m.:—

"A hostile aeroplane approached Sheerness at about 1.45 p.m. to-day, flying very high. Four bombs were dropped, three of which fell in the harbour. The fourth fell in the vicinity of the railway station, and damaged several railway carriages. British aeroplanes went up, and the raider went off in a north-easterly direction. No casualties are reported."

The Secretary of the Admiralty issued the following on October 22nd at 9.30 p.m.:—

"A hostile seaplane was shot down and destroyed this afternoon by one of our naval aircraft. The enemy machine fell into the sea. Judging by the time, it is probably the seaplane that visited Sheerness to-day."

German Version.

Berlin, October 23rd.

"Yesterday afternoon one of our seaplanes successfully dropped bombs on the railway station and docks at Sheerness at the mouth of the Thames."

"X 53" Raid, October 23rd.

The following *communiqué* was issued by the Field-Marshal, Commanding-in-Chief, Home Forces, on October 23rd, at 12.40 p.m.:—

"A hostile aeroplane was reported over Margate at 10.5 this morning. Three bombs were dropped in the Cliftonville district of the town. Slight damage was caused to an hotel, and one man and one woman were slightly injured. British aeroplanes went up in pursuit of the raider, who made off in a south-easterly direction."

German Version.

Berlin, October 24th.

"One of our naval aeroplanes yesterday morning bombed the harbour works and railway station at Margate, at the mouth of the Thames. In the afternoon of the same day, off the coast of Flanders, an enemy aeroplane squadron, composed of three seaplanes and two battle aeroplanes, was attacked by two German seaplanes, and put to flight, after fierce fighting. In the course of the battle an enemy seaplane was shot down, Pilot-Master Karl Meyer destroying in aerial fighting from his seaplane his fourth enemy aeroplane. Some time later these enemy aeroplanes, reinforced by six army aeroplanes, returned, but were attacked by eight of our machines, and driven off."

The Secretary of the Admiralty states that there is no word of truth in this message, except that a German aeroplane dropped bombs on Margate, as already reported in this country. What actually occurred was reported in the *communique* issued yesterday, viz.:—

"On the afternoon of the 23rd a naval aeroplane attacked four enemy seaplanes off Ostend. Our machine was under fire from all four seaplanes, but succeeded in bringing down one, which was completely destroyed, and in driving off the others, and this British naval machine returned safely and undamaged."

A Navy Day Gift from Overseas.

By way of celebrating Trafalgar Day, the Patriotic League of Britons Overseas presented £10,000 to the Admiralty to be spent on seaplanes. The money has been subscribed by Britons in the United States, China, Brazil, Abyssinia and other foreign countries, and since the outbreak of war the League, in conjunction with the Overseas Club has raised over £82,000 and has been the means of presenting more than 100 aircraft of various types to the Government.

Armchair Reflections by the "Dreamer"

Undoubtedly we are losing the "pretty" habit. No longer do we toy with things; playfulness is to the children, we are a nation who think only of the things that matter. Because the shops are to close earlier than ever before, I do not get into a pother; I have lost the pretty habit of shop-window gazing. There are things that I require, they come to me in the ordinary course. My food arrives from somewhere which is outside my business, I know only that it is on the table at the proper time. My clothing, scant in its newness as befitting the times, comes by a visit to my tailor. The train brings me to my office in the morning, a conductress takes my small coins when I travel by omnibus. The days come and go, I get all that I require, I require nothing beyond that which I get. We are grown sensible.

We have accepted many things as the inevitable during this upheaval of affairs, there is plenty of room for the majority of them to remain with us to our benefit when the war is ended.

There is little doubt but that the war came just in time to save us from ourselves. A few more years of fooling with pretty habits, and we should have become mentally effete, barren of ideas, worn out by excessive indulgence in the pretty little things that are the undoing of foolish nations.

We had grown accustomed to girls at the telephone exchange. We knew when we removed the receiver from the hook that a female voice would inquire the number of our pleasure, but we would ask in a short and business-like way for Gerrard nought-one-double-nought, without prefix or affix. There was no wanting in courtesy, it was a simple matter of business. When Phyllis first stood behind the hen-coup like opening at the station to issue my ticket, I always said "Please" and "Thank-you" in my best and most courtly manner, although in order to see through the opening I had to stoop in a most uncomfortable and undignified way. To-day I just slam down the money and say the name of the station required. Pretty manners take up valuable time in business hours, and elderly gentlemen who became wise before me are inclined to say cutting things if kept waiting.

There are many women in London to-day wearing trousers. A couple of years ago I should have had to manœuvre round that word when used with relation to women. They were supposed to be "unmentionables" for reasons unknown. There are, I say, women in London wearing trousers. They are window cleaners, and lamp cleaners, and in some cases van drivers. Not under all conditions are these suitable wear, under some conditions the old order of things would be absurd. Yet it is of the new order of things, and because women also are losing the pretty habit of being ridiculous, realising that business is business. In countries that had grown sensible before us, women workers in certain vocations had worn trousers for years.

Many things have gone, I hope never to return. We do not require public-houses to remain open well into the following day. Clothes do not make the man (excepting only khaki), although we have been long enough in realising it. The "Pot-hat" has gone to pot. The bird of gay plumage has moulted his pretty waistcoats. We are grown a nation of workers with no use for the pretty habits.

It may well be that the war has pulled the aviation industry out of the fire. Once I wrote in these pages a word of encouragement to those constructors so courageously watching a dwindling bank-balance the while they waited for official recognition and help. Possibly some pretty little habits have fallen from the order of things, and stern business necessity pointed to the only possible way of meeting demand. If such a pretty habit there have been, let it pass into limbo with the others, and not come creeping back with the establishment of peace, and the easing off of immediate necessity.

War found us wanting in aeroplanes, and those which we had were wanting in fitness for the purpose for which they were required. It would have been absolutely impossible to have brought things to the present high state of efficiency without the help of the civilian constructor, and the civilian designer.

It is certain that after the war progress in aeronautics will continue with unabating speed. I don't want to see the whole of the industry carried out in huge Government yards, to the exclusion of those who have strained every nerve to place our Flying Services where they are to-day.

I have not yet lost the pretty habit of grumbling, although there are signs of its abatement. People point to our Navy, and draw my attention to the fact that our battleships are not all erected in Government yards, and wonder that I should wonder whether aeroplanes will be. Still, I say I don't know. There are some pretty little habits still with us; we have not lost them all yet. And one of them used to be—I will put it that way—the habit of imagining that brains could not possibly be covered by anything but a tin-hat. Tin-hats and pot-hats, gold braid and blue overalls, it is all one so that we get that which we require, and anyone of the various wearers could be equally clever in the other's clothing.

AIRISMS FROM THE FOUR WINDS.

Some captured German aeroplanes, besides three Hun guns, will form one of the features of the Lord Mayor's Show on November 9th. The R.F.C. will also be represented.

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Reprisals are "barbarous," so the Germans claim, when practised on them. Already, at the mere suggestion of such deserved "reciprocity," the fear of God has taken hold of the inhabitants of several promising cities, where there are quite a number of quite historical edifices to tick off. Munich, Strassburg, Mannheim, Mainz, Cologne, Bonn and Metz are amongst the towns where the leading lights are seeking obscurity in subdued lights. Carlsruhe—where a sample has been left already—goes as far as holding a nightly service for Divine protection. Much quicker and more certain if they agitate for their own authorities to conform to the elementary rules of warfare between civilised nations. The prohibition of the ancient Xmas Fair at Mannheim for fear of raids is about as big a shock to the gentle Hun as could well be delivered. Yes, it certainly looks as if "reprisals" *is* the only remedy.

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Viscount Grey was sincerely convincing in his *résumé* of the start and conduct of war during his speech the other night at Foreign Press Association luncheon. His lordship is a great believer in the influence of science for good to this country in the future. His Council of Peace has great promise in it, especially as it would appear he advocates its backing with the wherewithal to enforce its edicts. It should carry a good deal of weight until another Hunnish combination fancies it is strong enough to try conclusions with the rest of the world. As Lord Grey put it tersely, the leading functions of this Council of Perfection would be to prevent the indiscriminate use of high explosives to destroy great cities and combatants and non-combatants alike, all these things which have been done in this war—the introduction of poisonous gas and disease. It will, he said, need all the efforts of belligerents and neutrals after the war to see that the inventions of science are used in the future in the air, on the land and on the water, not for the destruction of mankind, but for its welfare.

To which we subscribe without qualification. But let us nevertheless not be caught unready again.

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Holland appears to be in a quandary over the latest exploits of Zeppelins above Dutch soil. Cruising around over their military works is hardly a matter for joying about, even if the "bomb" which was dropped proves to have been a petrol or bully beef tin for which the Herr Commander had no further use. Even a worm will turn, and no doubt in time we shall have the Netherlands demonstrating that they at least are not too proud to fight.

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It is to be hoped a fairly accurate account of the amount brought in by airship relics for the Red Cross "Our Day" Fund will be available presently, as it should be as gall and wormwood to the All Highest to know that he not only lost his mammoth aircraft, but that it realised somewhere about its cost value for a cause of mercy, to the benefit of Britons.

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That "something" will happen before over long in connection with the Air Board which was so recently created, would appear to be a sure thing amongst those who are in touch with how matters aeronautical are shaping. It looks as if, once again, its formation was but still another trick to temporarily assuage public clamour. From the first it was evident its road would be thorny for want of executive powers. Promises, of course, there were in plenty to let the Board do what it pleased, but—— well, it's the same old tale again, and naturally ructions threaten. Whether the Parliamentary Air Committee will help to postpone the trouble, or, what is more likely, hasten it, is a matter of opinion. Their views of the situation are contained in the following resolutions passed last week :—

"1. That the Air Board should be so reconstituted as to include representatives of the Ministry of Munitions and the aircraft manufacturing trade.

"2. That the provision of material for the R.N.A.S. and the R.F.C. should be placed under the single control of the Air Board.

"3. That Mr. Balfour be asked to receive a deputation from the entire Committee as to the future policy of the Admiralty in regard to the R.N.A.S."

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An electric gun for bringing down Zeppelins sounds fascinating, and we join in Judge Atherly-Jones' wish that the inventor may speedily make a fortune from his invention. There's a fly in the ointment though, as usual. The inventor put his possession forward when brought up in the City of London Court as a judgment debtor, as a means of liquidating all his debts presently.

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Quinine three times a day or going into Army training are remedies suggested by Dr. Wynn Westcott to a man who confessed that Zepp. raids scared him.

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More peaceful application of aeroplanes. Last week, seeing a wagonette overturned at Wisley, Surrey, a pilot at once flew to Brooklands Aerodrome for assistance, with the result that an ambulance arrived quickly at the scene of the accident. The wagonette was conveying 14 Ripley members of the Surrey Volunteer Regiment to Merstham for trench digging, when a wheel came off, resulting in all the party, except one, being injured and cut by broken glass, five being removed to hospital.

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Princess Christian, who is always to the fore when any good work requires support, has generously contributed £530 towards the equipment of the new premises in Bryanstone Square of that splendid institution, the Royal Flying Corps Hospital. Amongst recent donations to the hospital is also a cheque for 50 guineas from Messrs. Armstrong-Whitworth. But the accommodation and support is, unfortunately, even now all too small for the cases which press upon the resources of the establishments, and further expansion is imperative in the near future. The success which has attended this hospital from its inauguration must be a source of gratification to those who have and still are giving unceasingly not only substantial sums to meet expenses, but personal help in the conduct of the hospital.

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One month in prison will doubtless teach William Jackson, a railwayman, that it is inadvisable to make false statements about Zeppelin raids. He was overheard on a tramcar.

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A good deal of speculation as to the exact method employed by the crew of "L.33" for setting her on fire when she came to grief in Essex on September 24th has been going on. Some people seem to imagine that all that is necessary is to fire a few revolver shots into the tanks, and there you are. As a matter of fact, of course, the mere firing of revolver shots into the tank will not necessarily set it on fire, and a much more ingenious method was, we understand, employed. In several places around the wreck right away from the petrol tanks, there were little marks on the ground where the grass had been burned away, and a little tin found among the wreckage gave the clue to how the fire was probably started. The little tin, was fitted with a lip, much after the fashion of the common or garden variety of sardine tins, and pulling this lip opened the tin. Inside was found a qauntity of powder, which, on being sprinkled on the ground, burst into flames. Evidently a number of these tins are carried, and when the moment came members of the crew emptied the powder out on the ground under the Zepp., and, being started at various points at once, one can imagine that the fire was not long in spreading.

It appears probable that the primary function of the incendiary tins was not so much for starting fires as for facilitating navigation at night. A few tins dropped into the sea would furnish sufficient light from which to get an idea of drift, &c., so as to not rely altogether on dead reckoning. By observing the path of the airship over these lights the real course and, as a matter of fact, the "ground" speed could be ascertained, and navigation consequently made very much easier.

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The sugar scarcity has many sides to it. If there is the real shortage which is claimed, why then in the name of common sense is not the manufacture of sweets and kindred "luxuries" restricted and regulated? There appears to be no limit to confections, which are almost blatantly in evidence all over London; but when it comes to our hospitals having to go short—and very short at that—then it is about time for the authorities to realise that there is a screw loose somewhere—they look to it that it is not *their* screw. This question may appear to have nothing to do with matters aviatic, but don't you believe it. To our sorrow we have reason to know in a degree how many of our flying men have to seek the shelter of the overworked hospitals. That such a soothing necessity as sugar should be found wanting in such circumstances does not reflect much credit upon the controlling powers that be.

* * *

Sir D. Haig on Air Work.

In his review of the operations from October 3rd, issued from General Headquarters on October 19th, General Sir Douglas Haig says:—

"The weather during the course of the operations reviewed has been consistently unfavourable for aircraft. Heavy rains and strong south-westerly winds have lowered the visibility, and have rendered their work most difficult. Yet in spite of such adverse conditions, our machines have made many valuable reconnaissances, and have repeatedly attacked with success enemy lines of communications, ammunition dumps and troops on the move. A captured document emanating from a German Army Headquarters, in acknowledging the superiority of the British airmen, suggests methods of reorganisation whereby it is hoped that 'it will be possible at least for some hours to contest the supremacy in the air of the enemy.'

"Assisted by our aeroplanes, our artillery has continued to play a notable part in the fighting. It has established and maintained a clear superiority over that of the enemy. It has supported our infantry attacks, and has disorganised the enemy's arrangements behind his front lines, and hindered the arrival of his reserves and supplies. It allows him no rest by day or night, and materially assists in that wearing down of his moral, which is vital to success in battle."

"Farming" Out "Air-Mechanics."

Eton Rural Tribunal has passed a resolution strongly protesting against the scandal of young bachelors passed for General Service, and who are neither pilots nor skilled mechanics, being allowed to join the Air Services. It is stated that the comparatively insignificent duties of these men could be as efficiently performed by C3 men or men over military age. It was stated that at one aerodrome there are 700 young men farmed to one contractor. Each is earning £2 a week civilian pay, and obtaining the separation allowance as well. When the day's work is done strings of cabs take the men to picture palaces.

Nailed to the Counter.

The following semi-official note was issued by the Belgian authorities at Havre on October 21st:—

"On the occasion of the raid on the centre of German aviation and military aeronautics in Brussels carried out at the end of September by English airmen, a number of civilians were killed and wounded and some damage was done to property. The German Press gave currency to the report that their casualties were due to the lack of skill of the English airmen and to their missing their aim. Information, however, is now to hand from Brussels through an uncensored channel, according to which the bombs dropped by the airmen hit their targets accurately, and the losses of life in question, no less than the damage to property, are attributable to the firing of the German artillery. The Belgian Government has in its possession material proofs confirming the truth of this (consisting of fragments of German projectiles)."

Sequel to Brussels Raid.

Some details as to the capture of the British pilot who failed to return from the Brussels raid are given by the Maastricht *Nouvelles* as follows:—

"After dropping five bombs on the Louvain-Tirlemont railway, the aeroplane was forced to descend owing to the failure of the engine during the night at Neerwinden. It was neither heard nor seen. The pilot and the observer attempted to re-start the engine, but without success, and they therefore set fire to it to prevent it falling into the enemy's hands. They then succeeded in hiding, and eluded capture until Tuesday, October 17th, when a squad of German soldiers appeared at the house of a schoolmaster in a small Flemish commune and arrested the two men in the school-house, where they had passed the night. The schoolmaster was also arrested on a charge of complicity, and the prisoners were then removed by rail."

Another German Fable.

In an official telegram sent out from Berlin on October 21st, it was stated:—

"On Saturday afternoon a German seaplane squadron successfully bombed English naval forces off the coast of Flanders. A hit was observed with certainty on one of the destroyers. All the aeroplanes returned safely, despite heavy firing."

The Admiralty, on October 23rd, issued the following:—

"There is no truth in the statement, contained in a report from Amsterdam of a Berlin official telegram dated October 21st, that a British destroyer operating off the coast of Flanders was hit by a bomb dropped from a German seaplane squadron."

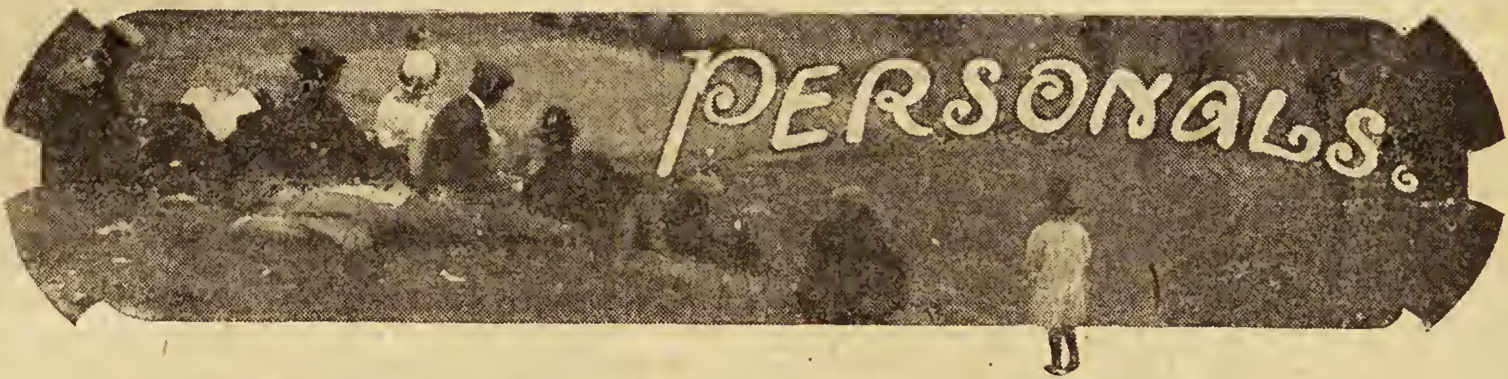
And yet Another Zeppelin Fairy Tale.

It was not to be expected that the German newspapers would be content with the official accounts of the raids of September 23rd and October 2nd, and so a most circumstantial account has been given out of the gigantic damage alleged to have been caused in England. According to this, in the first raid a hundred houses valued at £2,000,000 were reduced to heaps of ruins. Regent Street completely collapsed. An ammunition factory in South London was destroyed. Liverpool Street Station railway bridge and lines were so damaged that repairs will take some time. The Underground line to Piccadilly was closed for three days. In the course of the second raid two hundred families were rendered destitute. Twenty houses in Maple Street were damaged. At Thameshaven benzol tanks were greatly damaged, and the rice storehouses of Denny and Sons destroyed. At Grimsby, barracks were hit, and over four hundred soldiers killed. On the Humber a big cruiser was hit. At Leeds great havoc was done among the ammunition factories, railway stations, &c.

With reference to the above, the Press Bureau states: It is almost needless to say that this account of what is supposed to have been the result of this raid on land buildings is a ludicrous fiction. With reference to the Navy, the Secretary of the Admiralty states that there is not a word of truth in the statement that a "four-funnelled cruiser and two or more warships were damaged, and that sixty men were killed on board the four-funnelled cruiser in the Humber." No warship or merchant ship or any men belonging to the Royal Navy or to the mercantile marine were touched by Zeppelin bombs. The whole story is a fabrication.

Successful French Flyers.

The list of French flying men whose names have been mentioned in despatches is as follows, writes the *Daily Telegraph* correspondent in Paris:—Second Lieutenant Guynemer has brought down eighteen enemy machines; Second Lieutenant Nungesser, seventeen; Sergeant-Major Dorme, fifteen; Second Lieutenant Navarre, twelve; Sergeant-Major Lenoir, eleven; Lieutenant Heurtaux, ten; Sergeant Chainat, nine; Lieutenant Deullen, eight; Second Lieutenant Chaput, eight; Second Lieutenant De la Tour, seven; Second Lieutenant Pegoud, six (killed in action); Second Lieutenant De Rochefort, six (killed in action); Sergeant-Major Tarascon, six; Sergeant-Major Bloch, Sergeant Viallet, Sergeant Sauvage, Sergeant-Major Lufbery, American, and Sergeant-Major Flachaire, each five.



PERSONALS.

Casualties.

Captain N. A. Browning-Paterson, Royal Artillery and R.F.C., who is reported killed, was the younger son of Dr. A. Browning-Paterson, Coningham House, Uxbridge Road, W., and was 22 years of age. He was reported missing on July 21st, and is now officially stated to have been killed in an aerial action while leading a patrol over the enemy lines. Captain Browning-Paterson accompanied the first Expeditionary Force in August, 1914, as Second Lieutenant, taking part in the retreat from Mons and subsequent battles, receiving mention in despatches by Viscount French. He was transferred while at the Front to the Royal Flying Corps as Observer in September, 1915, and was gazetted Flight-Commander on July 3rd.

Captain Jack Cooper, R.F.C., who was officially posted as missing on July 21st, is now reported by the Geneva Red Cross to have been shot down and killed on that date over the German lines whilst on a bombing expedition. He was 20 years of age, and was the youngest son of Lady Cooper, of Ossemsley Manor, Christchurch, Hampshire. Captain Cooper was educated at Lockers Park and Harrow, and returned from Australia for the war. He joined the Royal Flying Corps, and got his commission in January, 1915.

Second Lieutenant L. C. Kidd, M.C., R.F.C., killed on October 12th, aged 23, was the second son of Dr. Cameron Kidd, of Bromsgrove, Worcestershire. Educated at Bromsgrove School, he took his pilot's certificate at Hendon before the war, and was tea-planting in Ceylon when war was declared. He returned as soon as possible, and was at once given a commission in the Royal Flying Corps, and after a short period of home training went to the Front in February last. Since then, with two short intervals of leave, he has been flying continuously at the Front. He was awarded the Military Cross only last week. His elder brother, G. P. Kidd, is a Captain in the R.A.M.C., and has been at the Front with a field ambulance since early in 1915.

The death in action is announced of Lieutenant Fenton Phillips, M.C., R.F.C. He was the eldest son of the Rev. E. S. Phillips, Rector of Bow, Devonshire, for some years Curate of St. James' Church, Hampton Hill. Lieutenant Phillips a few weeks ago was awarded the Military Cross for an act of bravery while engaged on air service. He served in the trenches for some months with the Artists' Rifles, and subsequently transferred to the Royal Flying Corps.

Lieutenant James Aitchison Stewart, R.F.C., who has died from wounds, was 26 years of age, and the eldest son of Dr. Robert Stewart, 25, George Square, Edinburgh. He leaves a widow, who resides in Wiltshire. Lieutenant Stewart was educated at Edinburgh Academy and Edinburgh University. Before the war he held a commission in the 7th Royal Scots, but resigned it in May, 1914. Immediately on the outbreak of war he was appointed to a commission in the King's Own Scottish Borderers, and after being at the Front for a time was invalided home with rheumatism. Subsequently he was transferred to the Royal Flying Corps. He received the wound which caused his death in a fight in the air.

Missing.

Flight-Sub-Lieutenant C. D. Newman, reported missing, is a son of the Rev. C. H. Newman, Vicar of St. Mark's, Sunderland. He was a student at the Medical College, Newcastle, when war broke out. After serving as a Surgeon-probationer for a year, he was transferred to the Royal Naval Air Service. He went to France only five weeks ago.

Married and to be Married.

An engagement is announced between Mr. Frederic Arthur Darien Grace, Second Lieutenant, R.F.C., late of San Pedro de Jujuy, Argentine, eldest son of Mr. and Mrs. A. A. Grace, of Alberdi, Santa Fé, Argentine, and Sybil May, youngest daughter of Mr. and Mrs. Herbert Apperly, of Highwoods, Kingswood, Surrey.

The engagement is announced between Robert Millington Knowles, Norfolk Regt. and R.F.C., younger son of the late Andrew Knowles and Mrs. Knowles, of Taverham Hall, Norwich, and Olive Marjory, younger daughter of Major and Mrs. J. A. Berners, of Hellesdon House, Norwich.

A marriage has been arranged between Ronald St. Clair McClintock, R.F.A. and R.F.C., youngest son of Mr. and Mrs. Arthur McClintock, of Rathvinden, Leighlin Bridge, Ireland, and Mary Gordon (Milly), elder daughter of Mr. and Mrs. John Macgregor Laird, formerly of Birkenhead, at present at the Hyde Park Gate Hotel, Kensington Gore, S.W.

The engagement is announced between Captain Douglas Charles Leyland Speed, King's Royal Rifles and R.F.C., younger son of Major and Mrs. Elmer Speed, of Knowlton Court, Canterbury, and 23, Prince's Gate, and Myrtle, second daughter of Sir Henry and Lady Dering, of Surrenden-Dering, Kent.

Items.

Lieutenant W. Eardley Harper, R.F.C., who has received the Military Cross for conspicuous skill in aerial combats, is the son of Canon Harper, formerly Rector of St. Margaret's, Leven, and St. Peter's, Kirkcaldy.

Lieutenant G. S. M. Insall, V.C., R.F.C. (who was brought down and taken prisoner about a week before the announcement of his V.C., which was awarded him for an achievement in November of last year), has just undergone a serious but successful operation for appendicitis at Heidelberg, and is now well on the road to recovery. This is the second serious operation performed on him while in captivity, the first being the extraction of a large fragment of anti-aircraft shell from the base of the spine. It is satisfactory to learn that he is receiving good attention.

Mr. Norman Prince, one of the American volunteer pilots with the American Squadron fighting in France for the Allies, who has just died in hospital behind the lines in the Vosges district, was wounded during one of the recent air raid fights against the Germans. He struck his head against a telegraph wire in falling, and died from hæmorrhage of the brain.

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Lord Montagu and the Air Board.

In the course of a farewell address at Brockenhurst on Saturday, Lord Montagu, who is returning to military duty in India, naturally touched on aerial topics. He said the present position of the Air Board was far from satisfactory. It had no real powers and was openly flouted by the Admiralty. How long was Lord Curzon going to tolerate this somewhat absurd position? Before long both the country and Parliament would demand that some more real powers should be given to the Board.

The recent raids on this country showed that our Home defences had improved, but it would be simply folly on our part because we had brought down four of the raiders if we did nothing more in the way of defence.

Lord Montagu also said that he thought the Admiralty were very seriously to blame with regard to airship construction. While the German Fleet was an eyed fleet, we had to a very great extent a blind one, but he believed that at last the Admiralty were doing something to accelerate progress.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters (France), October 17th, 10.26 p.m.

"The clear weather of yesterday gave scope for great aerial activity. Our machines made a large number of reconnaissances, and bombed enemy railway lines, stations, billets, factories and depôts. There were numerous fights in the air, three enemy machines being destroyed, another driven to earth and many dispersed. Two enemy kite balloons were attacked and forced down, one being afterwards seen in flames. One of our machines was brought down by anti-aircraft gunfire, and six others have not returned."

General Headquarters, October 18th, 9.38 p.m.

"Yesterday, besides many reconnaissances, our aircraft carried out three bombing raids against enemy communications, in which railway stock and station buildings were damaged and a train hit and derailed. There were many fights in the air, in the course of which four enemy machines were driven down damaged, and one fell into a lake. Four of our machines have not returned."

War Office, October 19th.

"*Egypt.*—On the Eastern Front a reconnaissance against the enemy at Moghara, 65 miles east of Samailia, has been carried out by a mounted force. . . .

"After an engagement lasting two hours, during which our aeroplanes repeatedly bombed the enemy main positions, we succeeded in driving him out. . . .

"Valuable information as to the dispositions of the enemy and the nature of the country was obtained."

Admiralty, October 21st.

"On the morning of the 20th inst. a naval single-seater aeroplane attacked and brought down a hostile kite balloon near Ostend. The balloon descended in flames. A similar machine engaged a large hostile double-engined tractor seaplane, shooting both pilot and observer. The seaplane sideslipped and dived vertically into the sea two miles off Ostend. The remains were later seen floating on the water. Both our machines were undamaged."

General Headquarters, October 21st, 10.55 p.m.

"Yesterday, the weather being clear, much successful work was done by our aircraft. We bombed enemy communications, and attacked among other points an important junction and an ammunition depôt, and derailed four coaches of a train. There was continuous fighting in the air, in which three enemy machines were destroyed and many others driven down in a damaged condition. Two of our machines are missing."

General Headquarters, October 22nd, 9.12 p.m.

"During yesterday's fighting our aeroplanes did valuable work in locating enemy batteries. Five enemy machines were destroyed, and four others driven down in a damaged condition. Three of our machines are missing."

General Headquarters, October 23rd, 9.40 p.m.

"Yesterday our aeroplanes bombed two railway stations behind the enemy's lines, hitting a train in motion and doing much damage to buildings and rolling-stock.

"Seven enemy machines were brought down and many others forced to land in a damaged condition. Eight of our machines have not returned."

French. *Paris, October 17th.*

"Our aeroplanes carried out numerous fights in the region of the Somme. They fought 65 engagements, in the course of which two enemy machines were brought down and three others came precipitately to earth in their own lines.

"German aeroplanes dropped several bombs on Amiens without doing any military damage."

Paris, October 18th.

"In spite of misty weather, our fighting aeroplane service displayed activity during the 17th. Three enemy aeroplanes were brought down on the Somme front. One fell in the direction of Aizecourt-le-Haut, the second to the east of Bouchavesnes, and the third, attacked by Lieut. Heurteaux, crashed to the ground between Rosquigny and La Transloy, bringing the number of aeroplanes brought down by this pilot to nine up to to-day. One of our aviators, who was attacked by three Fokkers between Roye and Lassigny, brought down one of his opponents and put the other two to flight."

Paris, October 19th.

"Yesterday our machines during the operations to the south of the Somme attacked with machine guns the enemy troops in the region of Biaches. It is confirmed that Adjutant Dorme brought down on the 16th a German aeroplane to the north of Péronne, this being the fourteenth machine for which this pilot has accounted. Another enemy aeroplane which was reported to have been badly hit on the same day fell to the ground and was dashed to pieces near Beaulencourt."

Paris, October 21st.

"Yesterday our chasing aeroplanes had numerous combats, in the course of which seven German machines were brought down, three of them in our lines. The latter fell between Bouchavesnes and Rancourt, the four others in the region of Moislains and Brie. Lieut. Heurteaux, who brought down one of them, has accounted for his tenth German machine. Four other enemy machines which were badly hit after fights with our pilots were obliged to come down in their own lines.

"During the night of the 20th one of our squadrons dropped 41 bombs of 120 mm. ($3\frac{1}{2}$-in.) on the stations of Noyon and Chauny, and afterwards more bombs were dropped on a train between Appilly and Chauny. On the same night 15 of our bombarding aeroplanes dropped 79 bombs of 120 mm. on the enemy cantonments and bivouacs in the region of the Nesle-Ham and on the aviation grounds at Matigny and Slez, which were hit."

Paris, October 22nd.

"On the Somme front our aviators yesterday brought down three German aeroplanes. Five others were forced to land in a damaged condition. During these fights Adjutant Dorme brought down his fifteenth enemy machine at Barleux, and Sergt. Flochaire his fifth machine, which was dashed to pieces on the ground in the same district. To the north of Verdun a German captive balloon which was attacked by one of our pilots fell in flames.

"During the night of the 21st six of our aeroplanes bombarded the railway station of Courcelles to the east of Metz. 180 bombs of 120 mm. were dropped on the buildings and on the lines, and appeared to have caused much damage. During the same night our squadrons dropped 50 bombs on the railway stations of St. Quentin and Tergnier, 16 bombs on bivouacs in the district of Etain, and 126 heavy bombs on the railway stations at Ham and Ethies and the aviation sheds in the region of Péronne. During yesterday a German aeroplane was brought down in our lines by the fire of our special guns."

Paris, October 23rd.

"This morning German aeroplanes dropped several bombs on Lunéville. There were no victims, and the material damage was insignificant. On the Somme front yesterday two German aeroplanes were brought down and three compelled to alight in a disabled condition. Yesterday 24 of our machines dropped 4,200 kilogrammes (over 4 tons) of bombs on the blast furnaces of Hagondange and of Pussinges (north of Metz), on the railway stations of Thionville, Mezières-les-Metz, Longwy, and Metz-Sablons. They attained their objective. On the same day another of our air squadrons bombarded an ammunition depôt at Mons-en-Chaussee (Somme). Finally, last night a bombing expedition against the factories of Rombach and the railway station of Mars-la-Tour achieved good results.

"This morning some German aeroplanes dropped several bombs on Nancy. There were no casualties, and only slight damage was done."

Russian. *Petrograd, October 19th.*

"In the region of the village of Potutory (south of Brzezany) an enemy aeroplane fell after being hit by our artillery fire. The machine caught fire as it struck the ground. The aviators were taken prisoners."

Italian. *Rome, October 18th.*

"Hostile aeroplanes dropped bombs on Borgo Carinzia and on our lines east of Gorizia without doing any damage.

"Our airmen destroyed an enemy kite balloon at Castel San Giovanni (Ivanigrad), east of Comen (Carso).

"French and Italian squadrons of seaplanes in the course of a general reconnaissance, boldly carried out by them along the west coast of Istria on Monday afternoon, succeeded, in spite of unfavourable weather, in successfully bombarding detached naval units near Rovigo, as well as military works at Rovigo, and at Punta Salvore. At one point they became engaged in a fight with enemy aeroplanes, and damaged two of them, one of which was seen to fall headlong into the sea. In spite of enemy artillery fire all the seaplanes returned safely to their bases."

Rome, October 19th.

"Hostile aeroplanes attempted to bombard the bridge over the But, in the neighbourhood of Tomezzo, without success."

Rome, October 23rd.

"On both sides aircraft were engaged in reconnaissance work. As the result of an air fight which took place over the Frigido (Vippach) Valley an enemy Albatros aeroplane was brought down."

German. *Berlin, October 17th.*

"Our battle airmen shot down six enemy airmen, and three of them fell behind the enemy's lines.

"Capt. Boelke again put *hors de combat* two enemy machines."

Berlin, October 18th.

"Five enemy aeroplanes were brought down in the course of aerial fighting."

Berlin, October 20th.

"Fifteen out of 40 British and French aeroplanes reached Oberndorf and dropped 60 bombs. The remainder of the hostile aeroplanes were dispersed by the attacks of our airmen, and dropped bombs at random on woods, meadows and small villages. Neither at Oberndorf nor elsewhere was any military damage done. Work at the Mauser factory was not interrupted. The three persons who were killed and the seven who were injured were all hit in the open air. Of the 40 aeroplanes, our airmen and anti-aircraft guns shot down nine. The following pilot and observers were killed: Guerinau, Baron Georges Jouan and Marchand. The following were made prisoners: Rockey, Sterdic, Bouet, Delcroix, Buckerworth, Nottay, Newman, Vittyn. The names of four of the occupants of the machines that were brought down could not be ascertained. No German machine was lost and no aeronaut was killed or wounded in the action."

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CORRESPONDENCE.

After the War and the German Trade-War Spectre.

[1929] Germany's intention to obtain an initial advantage in the fight for the world's trade is plainly seen in the social and economic reconstruction that has been proceeding throughout the Fatherland side by side with the country's gigantic efforts on all the war Fronts. In nothing is this idea of Germany more plainly seen than in the latest scheme announced, by which the great armouring firm of Krupp, with its scores of thousands of mechanics, is to be linked up with the North German Lloyd Steamship Lines. The Essen firm has now purchased an interest in the Steamship Company, and one of its directors is to have a seat on the board.

When war broke out official Germany had so organised its machine shops that only the pressure of a button was required to switch all the works on to munition making. All that is happening now shows that at the psychological moment the same procedure will be adopted, with this difference—German machinery will make wares for the world's marts instead of munitions for the Fatherland.

The adroit move of Krupp and the steamship company is not a mere private commercial transaction. It has a much wider significance, of which we in this country should take due note. While Teuton submarines have been busily engaged sending to the bottom as many British ships as possible, existing German craft have been safely interned in home or neutral ports. Meanwhile German shipbuilders have been steadily building new vessels for the mercantile marine, some of them of 20,000 tonnage.

It is Germany's ambition to emerge from the war, even if beaten, as the first shipping power in the world, and the new link forged between Essen Works and Bremen ships is another move in a well-matured plan to realise this aim.

The question naturally arises in one's mind whether we as a nation shall once more be caught napping. The British Government has had to be whipped into action in many directions, and even to-day it seems next to impossible to close up German businesses in Britain long since marked down for extinction. How far positive progress has been made by any of the Government committees appointed to consider questions of After-the-war-trade it is impossible to say, since not one of the committees has issued a report. Months ago there was noticeable activity in certain industries, chiefly in the formation of trade associations, but this seems to have died down.

Wise men judge the future by the past, and, adopting this formula, we shall probably find that British trades and industries will progress and flourish just in proportion as they concentrate their energies *now* upon perfecting their organisations and co-operating in a commercial campaign conducted in every corner of the world. In a word, our industries will rise or fall according to the wisdom and the extent of the efforts of their organisers.

So far as the motor engineering industry is concerned, we feel that it will require a far more powerful effort than has yet been put forth if it is to cut a creditable figure in the impending trade war, and anything that the Government can do to strengthen the position will be heartily welcomed.

Barimar, Ltd. (Scientific Welding Engineers).
C. W. Brett,
Managing-Director and General Manager.
10, Poland Street, Oxford Street, W., Oct. 20th.

The Supporters of the Aeronautical Institute.

[1930] With reference to the paragraph in your current issue headed "The Aeronautical Institute and its 'Supporters,'" in which it is said that Lord Montagu understands that the Institute is using his name although he had withdrawn his support from it, we would ask you to be good enough to publish the enclosed letter which we wrote to Lord Montagu on the 13th inst., as well as a copy of his letter to us, and which explains clearly our position with regard to him.

It is hardly necessary to add that, after our letter to Lord Montagu, we lost no time in removing his name from our list of supporters, who, with one or two exceptions, are members or donators or both, and that on Monday, the 16th inst., the nearest possible day after our communication to him, we had a new list of supporters printed, from which we had removed the names of two retiring supporters, as the enclosed two printed lists—the old one and the new one—will show you.

L. Blin Desbleds,
Oct. 20th. Hon. Director and Hon. Secretary.
(Enclosures.)

62, Pall Mall, London, S.W.
October 12th, 1916.

Dear Sir,—Please see that my name is removed at once from your list, as I wish to sever all connection with the Aeronautical Institute, and to point out that I desire that in future my name shall not be used in any way by your Society, and I would bring to your notice that I have never given any authority that it should be used for any purpose whatever.

Kindly acknowledge this letter.

Yours truly,
L. Blin Desbleds, Esq. (Signed) Montagu.

3, Arlington Street, St. James's, S.W.
October 13th, 1916.

Dear Sir,—In reply to your note of the 12th inst., we shall, of course, do as you wish and remove your name from our list of supporters.

We desire, however, to tell you that we do not understand the tone of your communication, and that the only way we can account for it is that it was written under some misapprehension, the origin of which we cannot fathom.

Unless you, yourself, furnish us with an explanation warranting the tone of your note, we cannot, of course, pretend to regret the removal of your name from our list.

We would remind you that on February 19th, 1916, we received a letter informing us that you had "pleasure in supporting" the work of the Institute.

You may be assured that in any list of supporters printed after to-day's date your name will not appear.

Yours faithfully,
(Signed) L. Blin Desbleds.
Lord Montagu of Beaulieu.

AVIATION IN PARLIAMENT.

Alleged Defective Aeroplanes.

IN the House of Commons, on October 19th, Mr. H. A. Watt asked the Secretary of State for War whether complaints have been received of the machines provided for the use of a squadron of the Royal Flying Corps which was due to leave for the Front; whether these machines are a British copy of a successful French design; whether they have been reported as inherently unstable and dangerous in landing; whether only two of these out of five arrived safely in a recent squadron flight from one aerodrome to another; and what steps he proposes to take in the matter?

Major Baird (representing the Air Board): The first trial of the aeroplane referred to in my hon. friend's question gave rise to certain criticisms. It was therefore sent to the Expeditionary Force for further trial in comparison with French-built machines of the same type, and the report on it was favourable except for two minor matters which are being attended to. The reply to the second part of the question is in the affirmative. As regards the third part, I am informed that the machine is not inherently unstable, and not unduly difficult to land, though no doubt not a beginner's machine. Nothing is known of the incident referred to in the fourth part of the question. I may add that exactly the same type of machine is and has been for some time past constantly and successfully used against the enemy by the Royal Naval Air Service.

The Design of the "Tanks."

QUESTIONED in the House of Commons on October 18th by Capt. Burgoyne, the Parliamentary Secretary to the Admiralty (Dr. Macnamara) said: There is no doubt that the idea of employing armoured cars for trench warfare occurred independently to several people, and all that the Admiralty can do is to state what appears in the Admiralty official records. According to these, the idea was suggested to officers of the Royal Naval Air Service by their experience of the naval armoured cars in Flanders in the early days of the war. After various experiments by the officers of the Royal Naval Air Service, my right hon. friend (the late First Lord) instructed Mr. d'Eyncourt, the Director of Naval Construction, to undertake the design of a "Tank" or landship, capable of carrying out certain definite performances.

The officers of the Air Department at the Admiralty primarily concerned were Commodore Sueter, Wing Commander W. Briggs, and Squadron Commander T. G. Hetherington. While the principal credit for the design of the "Tanks" now being employed at the front rests with Mr. d'Eyncourt, the latter has mentioned the following gentlemen as rendering him valuable assistance:—Mr. W. O. Tritton, Managing Director of Messrs. W. Foster and Co. Ltd.; Lieut. D. G. Wilson, R.N.A.S. (now Major Wilson, M.G.C.); Mr. P. Dale Bussell, Contract Department, Admiralty; Lieut. A. G. Stern, R.N.A.S. (now Lieut.-Col. Stern, M.G.C.); Capt. Symes, M.G.C.; Mr. F. Skeens, Acting Assistant Constructor.

Compensation for Raid Injuries.

SIR E. CORNWALL, in the House of Commons on October 18th, asked the Prime Minister whether the Government propose to establish a satisfactory system of pensions or grants in cases where, as a result of injuries or loss of life arising out of Zeppelin raids, the families affected are reduced to straightened circumstances or left unprovided for?

The Prime Minister: It is not proposed to make any alteration in the system whereby provision can be made against such losses by insurance under the Government scheme.

Mr. Hogge: Has the Prime Minister considered the case of people who have their relatives killed? Does he not think that a woman whose husband and all her sons who have worked for her have been killed by Zeppelin bombs in this country should have some sort of provision made for her by the State?

The Prime Minister: Perhaps my hon. friend will give me notice of that question.

Mr. W. Thorne: May I ask whether it is correctly reported in the papers that the Government have taken responsibility where men in factories and workshops are killed and injured through bombs in aircraft raids?

The Prime Minister: I should like to have notice of that question.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

CIRCUITS with Instructor last week: Lieut. Kaizer. Circuits alone: Messrs. Robertson, Steeves, Green, Woods, Travers, Whiteman, Lord, Norris, Hitchcock, Ranson, Sutherland, Munro, Rogers, Saunders, Styles, and Zambournis.

Instructors: Messrs. Manton, Winter, Pashley, Hale, and Biard.

Hall School, Hendon.

PUPILS at work last week:—With Gerald Smith: Messrs. Bateman, Lambert, Barton and Smith. With Cecil M. Hill: Messrs. Dutton and Cowell, Lieut. Malden, Mr. Bateman and Sergt. Jones. With Fred J. Glegg: Messrs. Blake, Pugh, Course, Mayer, Heathcote, Yuill and Foster. With Stanley G. Cownie: Mesrs. Gamble, Lester, Todd, Rogers and Hewett.

Royal Aero Club certificates successfully passed by Mr. Bateman, Sergt. Jones, Messrs. Cowell and Lambert Barton.

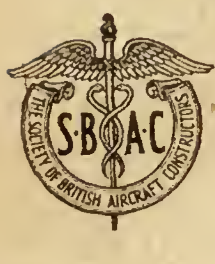
Hall Government-type tractors in use.

* * *

An "Aerial" Work of Art.

THERE were few visitors to the Royal Academy Exhibition this year who were not impressed by the wonderfully realistic oil painting by Lieut. F. Gordon-Crosby depicting the destruction of a Zeppelin by the late Lieut. Warneford, V.C. The picture has now been reproduced by the four-colour process, and the result is a delightful work of art. In the print that real sense of atmospheric beauty—so great a feature of the original—is very happily reproduced, and the feeling of distance has lost none of its effect. The delicate colouring of the landscape, stretching far below, has also been retained. It is certainly one of the finest aviation pictures so far produced, and the publisher, Mr. W. R. Deighton, 4, Grand Hotel Buildings, Charing Cross, W.C., is to be congratulated upon his enterprise and judgment. It is to be hoped that the reception of the print will be sufficient to encourage Mr. Deighton to publish other "air" pictures. The facsimile—the size of the print being 15 by 10 ins.—is priced at 5s. per copy, and we understand that a few signed artist's proofs are available to early applicants at one guinea each. The small block which we give of this picture gives a faint idea of the fascination of the work of Mr. Gordon-Crosby.

SIDE WINDS.



THE Society of British Aircraft Constructors, Ltd., have adopted a device for use by members of the society on their notepaper, &c., indicating membership. Naturally as aviation would suggest, the old-fashioned monogram has been avoided and an artistic emblem evolved, as may be judged by the reproduction of the device.

- - -

MOTOR RADIATORS, LTD., who make and repair any type of radiator for aircraft or car work, announce that they have moved their offices and works in Hanway Street to their main premises, 80, Faroe Road, Kensington, W. They are, however, retaining their Hanway Street place as a receiving depôt.

- - -

TAPES of all sorts and sizes are a speciality of Messrs. John MacLennan and Co., of 30 and 31, Newgate Street, London, E.C, an enterprising firm who have been quick to realise the requirements of the aircraft industry as regards "smallware." They also cater for the electrical trade, and among the goods which they can supply may be mentioned silk tapes for insulating; fine Egyptian tapes for insulating, binding and transformer; grey and white India dynamo tapes for insulating and binding; cotton webs and banding; tubular braids and casing to cover electrical wires; hemp binding cord (½-lb. cord); flax kite cord (No. 1 kite cord); linen sewing thread—all to pass A.I.D. inspection.

- - -

WITH a view to the centralisation of effort, the Navarro Aircraft Co., Ltd., are giving up their London office at the end of the week. All communications should in future be addressed to the head offices of the firm at Burton-on-Trent.

- - -

ALWAYS anxious to assist their friends as much as possible, the Fellowes Magneto Co., Ltd., have sent out a little map and full instructions as to the best ways of getting to their new works at Cumberland Avenue, Park Royal, Willesden, N.W. In making a note of this change of address, it should also be remembered that the 'phone call is now Willesden 1560 and 1561. This is also a reminder that this firm, which has had a unique experience in the repairing and manufacturing of magnetos for many years, is now in possession of their extensive new works, which have been laid now and equipped for turning out magnetos in large quantity. By the consistent quality of their magnetos, which are greatly in demand for aircraft engines, the firm has built up a splendid reputation, and perhaps the best testimonial which the firm could have is that the new works have already proved too small and considerable extensions are now found to be necessary. These are now well in hand.

- - -

THOSE whose memory takes them back to the Aero Show at Olympia in 1911 will recall the beautifully-made tandem monoplane exhibited by Messrs. William Cole and Sons, the woodwork of which aroused admiration far and wide. At that time unfortunately the firm found no encouragement to go on with their enterprise, but times are changed, and seeing an opportunity of utilising their highly skilled workmen for the benefit of aviation and the nation, Messrs. Cole have again taken up the work. Not only woodwork but also metal parts are being turned out in the works, and in order to give full scope to their efforts all their coachbuilding business is being cleared out. At present attention is being concentrated on parts such as wings, parts, elevators, &c., but before long it is hoped that arrangements will be complete for the machines to be built throughout. It is almost needless to add that the craftsmanship which had made Cole coachwork a hall-mark of quality, is seen at its best in the new department. Not only has the firm in its splendid and extensive stock of well-seasoned timber a most valuable asset, but the wide and extensive experience of Mr. Albert Cole, and all who are associated with him, is a great advantage. The shops are all room and light, and therefore admirably adapted for aircraft work, while in the metal working shops their present comprehensive installation of machine tools is being rapidly added to. One advantage is the handiness of the firm's establishment in the Hammersmith Road.

COMPANY MATTERS.

General Aviation Contractors, Ltd.

THE statutory meeting of the creditors of the above-named Company was held at 48, Watling Street, E.C., on Tuesday, the 24th inst., when practically all the creditors were present, either personally or by proxy.

The liquidator (Mr. W. A. Casson) presided, and a resolution was passed confirming his appointment as liquidator.

An alternative resolution was proposed by representatives of Mr. Domenic Lawrence Santoni to the effect that an application should be made to the Court for the appointment of another liquidator, but this was negatived on a vote.

The liquidator stated that there were very few creditors of the Company, and that he expected that all *bona fide* claims would be paid in full.

He stated that the Company now had no business to carry on as its interests in other companies had been disposed of and the goodwill of its aviation business had been sold to the General Aeronautical Co., Ltd., directly after the commencement of the war. Litigation was pending against Mr. D. L. Santoni for an account of his dealings with certain of the Company's interests in the Societa Anonima Costruzione Aeronautiche Savoia and the Agenzia Generale Forniture Aeronautiche, Italian companies, and for the return of considerable sums of money which, it was alleged, had been improperly paid away. An action was also pending against Messrs. Osborn and Osborn, the late solicitors of the Company, for an account of certain transactions in which they had been concerned.

The liquidator said that one of the principal objects of the liquidation was to bring to an end the influence that Mr. Santoni had exercised in the past on the Company's affairs. Of the three actions that had been brought, one of them related to the transfer of a liability incurred by Mr. Santoni to the Company, although the Company never was a party to the contract. It was an action for £550 against Mr. Santoni for moneys which he had from the funds of the Company, whilst he was holding the position of managing-director. That and other actions that had been commenced against Mr. Santoni would be pursued with vigour.

The proceedings closed with a vote of thanks to the liquidator.

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Aeronautical Patents Published.

Applied for in 1915.

Published October 12th, 1916.

13,575. E. R. CALTHROP. Captive balloons.
17,437. A. A. HOLLE, A. W. JUDGE, AND VARIOPLANE CO. Aeroplanes.

Published October 19th, 1916.

3,368. L. BONGIOVANNI. Reversing-device for braking aeroplanes.

Published October 26th, 1916.

12,820. G. A. OGRISSEK AND J JAWORSKY Air-craft.
15,079. W. LOVE. Dirigible balloons, or airships.

Applied for in 1916.

The numbers in brackets are those under which the specification will be printed and abridged, &c.

Published October 5th, 1916.

10,358. H. MIDDLETON. Fin or wing motion and mechanisms. (101,403.)

Published October 12th, 1916.

1,467. S. E. SAUNDERS. Aircraft. (101,434.)
4,511. T. D. KELLY. Planes for aeronautical machines. (101,442.)

Published October 19th, 1916.

2,647. R. CAUDRON. Controlling devices for aeroplanes.
4,897. N. L. SYBERG. Flying machine fuselages.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

THE Air Board stands confessedly a failure. It was bound to be in the very nature of its constitution. Devoid of any vestige of power to enforce its views on either the Admiralty or the Army Council, and with no clear idea of its own *raison d'être*, it would have required a miracle to make it a success—and the age of miracles is past.

The Air Board.

We have heard a great deal recently about the impossibility of the Admiralty attitude towards the Board, and it is on the shoulders of the Admiralty that the major portion of the blame for the Board's failure is placed by the critics who stand outside and comment from a standpoint which necessarily is one of insufficient premises. Vaguely we hear rumours that the Admiralty blocks the way to progress, but we are not told exactly what shape the opposition takes. Opposition there may be, but the crux of the matter is that the whole constitution of the Air Board as ultimately framed, without any executive power whatever, was wrong from the start. It has been tried and found wanting. It was conceived as a stop-gap, and, like all stop-gaps, it was foredoomed to failure. Not but what it has done a certain amount of good work in a few directions, but it most certainly is not the body with its mere advisory powers that was required to infuse something like cohesion into our Air Services.

Criticism of this kind is easy enough, we know. What is required at this juncture is something constructive. What is it, then, that is required to replace the Air Board? It has been strongly urged that what we require is an Air Service, separate and distinct altogether from the Navy and Army, having is own board of control and responsible only to Parliament. That is to say, there should be created out of the R.N.A.S. and the R.F.C. a new Service, using the word as we now understand the Navy and Army. As a result of the Air Board experiment, let us confess that we regard this as impossible now. Whatever may be the case in the years to come, with the war in full blast, it would require considerable optimism just now to justify such a course. Within a decade, or perhaps two, supremacy in the air will mean all that is implied in the command of the sea now. But that day is hardly yet, and we have to regard the situation as it exists to-day, and as it will continue to exist for at least the period of this war.

Let us examine for a moment the true relation of aircraft to naval and military operations. The aeroplane and the airship have two main functions—those of long-range artillery, and long-range reconnaissance. These functions are so integrally a part of the larger tactics of war, that they cannot be separated from the main issues any more than can, let us say, the functions of the artillery arm. It would be possible to elaborate this point to a much greater extent were it necessary, but the argument will serve as it stands.

Now, if we concede this simple proposition, the case for a separate Air Service falls to the ground for the time being. But admittedly the present position is impossible. Jealousy and competition between the two Services are doing much to hamper efficiency and to bring the administration of the flying services into disrepute, while there really appears to be serious danger of the main issues of the war being lost to sight while the War Office and the Admiralty are fighting among themselves.

On Tuesday afternoon Mr. Balfour met the Air Board to discuss the situation, and in particular to talk over the future of the R.N.A.S. Apparently the meeting got us no farther in the direction of a clearing of the present unsatisfactory position of things. We did not think it would. What is required is not the discussion of academic attempts to reconcile conflicting interests, but the immediate application of a drastic remedy which will relegate existing competition and overlapping to the place they belong. That remedy we believe to be the formation of a central air authority—whether it be the Air Board reconstituted or otherwise—not to interfere initially with the tactical dispositions of either of the two Air Services, but with absolute power in all matters save this and internal administration. It should have—as most people thought the Air Board would have—complete control over all contracts for machines and supplies, thus putting an end to the present ruinous competition between the two services. In or after consultation with the Admiralty and the Army Council it should deal with strategical dispositions in so far as the definition of what may best be described as the respective spheres of activity of the two services are concerned. We should like to be more precise on this point, knowing what we do of the impossible situations which have arisen as a consequence of the overlapping of duties, but for obvious reasons we must refrain. Such powers vested in the present Air Board, which is admirable in its composition, would end the present most unsatisfactory state of things, which is the fault of the system more than of individuals. Whatever is to be done must be done at once. It is worse than deplorable that after 27 months of war we should have to discuss ways and means of stifling inter-departmental jealousies, and it cannot be too strongly insisted that now the way out has been indicated the remedy must be applied without an instant's delay.

Reprisals, the only way. A month ago, when dealing with the subject of air-raids on this country, we said that very reluctantly we had come to the conclusion that the only effective means of bringing these to an end lay in reprisals in kind. In this connection it is interesting to note the tone of the American Press, reflected by correspondents who are intimate with the Germany of to-day. They appear to be all agreed that there is only one thing that is likely to appeal to the German people, and that is strong doses of their own medicine of "frightfulness." The *New York World*, for example, prints a communication from one of its correspondents—an acknowledged pro-German too—in which he says that our failure to adopt any sort of reprisals for Zeppelin raids or the inhuman treatment of prisoners is wholly misunderstood by the Teutonic mind. The Germans believe that our failure to reply in kind to air-raids is because we have not the means. The correspondent adds that the German popular mind thirsts to kill British non-combatants and women and children. We quite believe both statements. So far as concerns the latter, we can afford to smile at the readiness of the Hun population to gloat over the killing of civilians and of women and children. The mere readiness to gloat is amusing, but it ceases to be so when the killing is an accomplished fact, even though it be on a small scale and not wholesale as was witnessed in Belgium and Poland. It is only less unpleasant to contemplate the killing of enemy civilians, but if through it lies the only means of protecting our own shores and the lives of our own people, then sentiment must go by the board and we must pay the enemy in his own coin—raid for raid—until the German populace have learnt that to hanker for the blood of their enemies is not in accord with the very best teachings of up-to-date *Kultur.*

Apparently we are at last determined to carry the war into the enemy's country. According to the French *communiqués*, a number of British aeroplanes carried out a successful raid on the blast furnaces at Hagondange, which is near Thionville and Metz. The primary purpose of the raid was a military one—to destroy enemy munition works—but it appears to have a significance all its own. This part of the Allied front is far removed from the British sphere of operations, and all raids of the past have been carried out by French aircraft. The fact that British machines, and British machines alone, were allotted the task is a reply of the right sort to the German idea that we do not strike because we have not the means at our disposal. It is very much to be hoped that this new departure is the forerunner of many more such enterprises, for we know from the experience of the French that the Hun is very susceptible indeed to equality of treatment in the matter of frightfulness.

In the treatment of prisoners, France has replied by meting out to captured Germans exactly the same measure as her own men in the hands of the enemy have received. As a direct consequence, French prisoners in Germany have been accorded better treatment. We, on the other hand, know the appalling conditions under which our unfortunate people are compelled to exist in German prison camps, and yet we continue to treat Hun prisoners almost as honoured guests. They live in comfort and are fed on the fat of the land, our reward for this being that we are regarded as fools and weaklings. The fact of the matter is that the Hun is like any other savage—the only appeal to his sensibilities is through his hide. He understands no argument save that of brute force and brutality. There is only one way to deal with the type. Measure for measure must be the policy, distasteful though it may be to our ideals of civilisation. You cannot cow a mad dog by reading a tract to him, but that is what our political know-alls seem to think is the best way of dealing with the case of the mad dog of Europe.

* * *

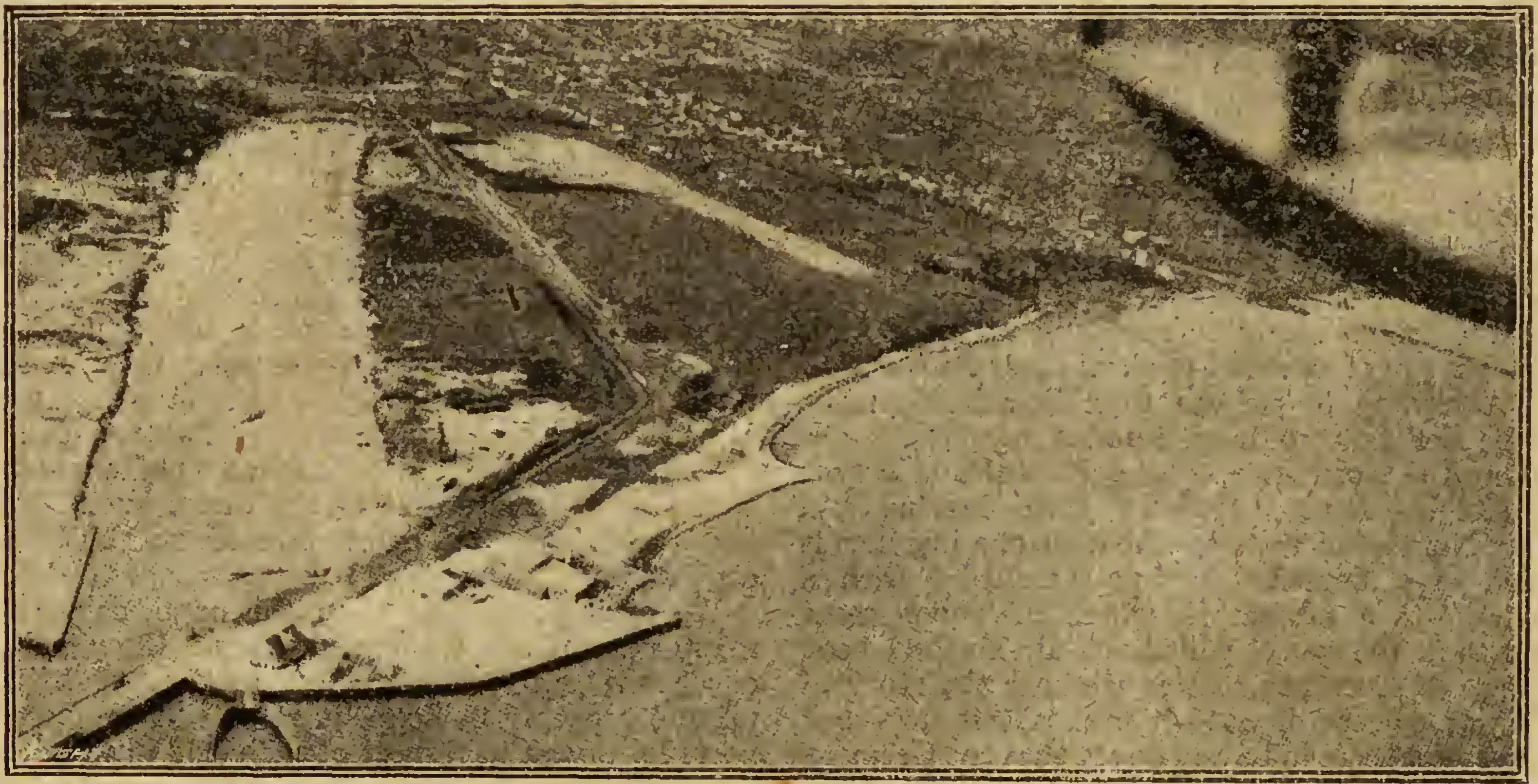
Posthumous Honours. In the House of Commons last week Mr. Redmond asked the Secretary for War whether, in view of the injustice to the memory of officers and men who died after the performance of deeds of great valour in the field, by reason of the regulation which prevents the conferring of any posthumous honour or decoration except the Victoria Cross, steps would be taken to alter the regulation so as to enable the D.S.O. and Military Cross to be conferred in cases of death.

Mr. H. W. Forster replied to the effect that the subject was a very difficult one, but he assured his questioner that very sympathetic consideration would be given to it. And so for the moment the matter stands thus! Where in the name of everything is the difficulty, except in the eye of the official expert in red-tape? To the ordinary mind the matter is simply one of altering a regulation which stands convicted of injustice to many of our gallant dead. If the Victoria Cross is sometimes awarded posthumously, why then cannot the lesser military orders be so awarded without, as the Under-Secretary for War appears to fear, causing the heavens to fall? To our way of thinking, the reform is one that should be made without delay. A gallant deed is no less brave when its doer loses his life in its accomplishment than if he survive. And the stereotyped intimation in so many cases that: "Had he lived, he would certainly have been recommended for the D.S.O.," does not carry the balm to the stricken ones left behind that the grant of the honour itself would do.

An Army Order has just been issued which lays it down that orders and decorations awarded to soldiers "who have not survived to receive them since August 4th, 1914," may be publicly presented to the next-of-kin. This is not at all the same thing as a concession of the awarding of posthumous honours, a concession which, in spite of the "difficulties" surrounding it, we trust to see made at an early date.

* * *

The Channel Raid. For some considerable time past the Admiralty has shown a deplorable want of frankness in its *communiqués* relating to the sea affair. Even though there may be no official announcements, neither the Admiralty nor any other authority can altogether suppress the circulation of reports of things doing around the coast, and the very natural consequence of this want of candour is that rumour and report far more harmful to the national nerves and interests become rife. The latest example of this policy of hyper-secretiveness is in the official *communiqués* dealing with last week's raid of enemy destroyers in the Channel. If the Admiralty thinks that the enemy might benefit by the telling of the whole story, then so be it—we have no desire for mere news at the expense of giving valuable information to Germany. But there is of a certainty something more due in the way of a statement than the very fragmentary and unsatisfactory one that has been



The Atlantic Coast Aeronautical Station at Newport News, as seen from one of the Curtiss School flying boats.

issued. For one thing, we should like to know that adequate measures have been taken to avoid a repetition of the incident, and particularly that steps have been taken to render it more difficult for German reconnoitring aircraft to come over the Kentish coast and gain information about our patrol arrangements and the naval force available for the protection of the cross-Channel routes. There has been observable lately a marked activity in the enemy's air services, or in that branch which is entrusted with the duties of what we may call overseas patrol and reconnaissance. Our own coasts are very frequently visited by enemy planes, and so far as we can judge from the material available in the official reports of these visitations, the reconnoitring craft usually get safely away. We appreciate perfectly well the difficulties there are in dealing with such visitors, and, therefore, we know the futility of expecting that every German machine that appears over our coast should be destroyed. But it is not asking too much that we should receive the assurance that everything humanly possible is being done to reduce the number of our unwelcome visitors. We do not want to appear to criticise unduly, but it does seem beyond all reasonable doubt that the enemy was in possession of fairly exact information as to the distribution of the local naval forces, which enabled him to carry out his raid with a fair measure of success. For we must concede him that much. The Admiralty report has it that the raiding destroyers were "driven off," which argues that we were compelled to fight a defensive action. Is the Admiralty satisfied that that information was not obtained through aerial reconnaissance, at least in great part? And if the enemy got his information in this way, why did our own reconnaissance not give the German show away? Assuming that the German destroyer flotilla started from Zeebrugge—which appears to be the accepted idea—it would seem almost impossible for 10 modern destroyers to be concealed in that port from the observation of our own aerial reconnaissance. Of course, the affair may have some very full and adequate explanation, but, on the face of it, it appears that something was wrong.

* * *

Sea Patrol by Zeppelins. There is another phase to the activity of the enemy in the air which is becoming increasingly manifest. This is in the employment of airships in sea patrol and for co-operating generally with the fleet, or such part of it as dares to show itself on the high seas. According to reports from Scandinavia, the Germans are using a large number of airships for patrolling the Norwegian coast. It is also said that these airships have "chased" ships leaving and entering Norwegian waters. At least one instance is recorded of a Zeppelin having signalled "with a large flag" to a submarine, which thereupon came up and sank the vessel which the airship had been pursuing. It does not matter whether the story of the flag is correct or not—it probably is not—but there does not seem to be any doubt that the Germans are making full use of their airships for what we conceive to be the real rôle in war of this type of aircraft.

The war has demonstrated that "invasion by airship" is a myth. It has further demonstrated that the airship, vulnerable as it is to attack by aeroplane and guns, is useless for reconnaissance over enemy positions, especially by day when reconnaissance must be carried out. But as the eyes of a fleet, as we have so persistently urged, it unquestionably has a very high value, which has from long before the war been realised by the German High Command.

If only our own naval and military authorities had listened to the voice of warning—!

* * *

After the War. It is undoubted that Germany's policy now is to so reduce the mercantile fleets of the world by a ruthless submarine and airship war, building herself at the same time, that at the end of the war she may find herself the principal maritime carrying Power. There is the one way which we have advocated in the past—and one way only—to counter this policy. Let it be stated with all the weight of authority possible that, given that the war ends as victoriously as we intend it shall end, a part of the terms of peace will be the handing over of ton for ton in the various classes of ships in replacement of vessels destroyed by German warships. By classes we mean, for example, the *Vaterland* for the *Lusitania*. There must be no replacing a thousand tons at £8 per ton for a thousand at £80. We know that the mere suggestion that this may be a part of the programme has frightened the German shipowning interest, and if that is so how much more effective would be the categorical announcement that we intend to exact full reparation for at any rate our own and our Allies' marine losses. Those who are too proud to fight in defence of civilisation's rights and interests must expect to look out for themselves.

Further, we must see to it that the very drastic suggestion now put forward should be carried through, that at least for a term of years no German ship, man-of-war or merchantman, is given the hospitality of a British or Colonial port. Our coaling and oil-fuel stations must be absolutely closed to all German vessels for a term proportionate to the amount of wanton and illegal destruction of merchant tonnage perpetrated by the apostles of frightfulness.

Shipping *qua* shipping has, we acknowledge, nothing in particular to do with "FLIGHT," but as a vitally national concern it has a great deal to do with all of us. There must be a national policy to secure our position as a maritime nation after the war, and it is, therefore, the duty of every journal and individual to use all the influence at command to ensure that we shall have such a policy and insist upon its being pressed ruthlessly to a conclusion.

We even go farther than this, and, as we have many months ago demanded, extend the penalty to cover the destruction of non-combatant life and private property in Zeppelin raids. If we close our ports for a year in respect of each raid in which such losses occur, it will perpetuate the lesson that in the long run the methods of barbarism do not pay.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, October 24th.

Lieut.-Com. (Squadron Com.) H. A. Williamson appointed as Acting Com., to date Sept. 2nd.

The following have been granted temp. commissions as Sub-Lieuts., R.N.V.R., to date as stated: Chief Petty Officer W. J. Liberty, Oct. 16th; and F. H. Hudson, Oct. 16th.

Admiralty, October 25th.

Temp. Lieut.-Com., R.N.V.R., R. W. McGrath appointed as Temp. Acting Com., R.N.V.R., to date Oct. 23rd.

A.B., R.N.V.R., A. M. Humble-Crofts granted a temp. commission as Sub-Lieut., R.N.V.R., with seniority Oct. 21st.

The following have been entered as Proby. Flight Officers for temp. service, all to date Oct. 29th: D. A. Stamps, F. J. W. Mellersh, H. C. Arnold, C. R. Pegler, D. F. Warren, E. M. Porter, W. J. K. Gulland, J. S. de Wilde and H. B. Brearley.

Admiralty, October 26th.

A. W. Phillips and A. B. Mackintosh have been entered as Proby. Flight Officers (Temp.), and appointed to the "President," for R.N.A.S., to date Nov. 5th and Oct. 24th respectively.

Admiralty, October 27th.

A. B. Murray granted a temp. commission as Sub-Lieut., R.N.V.R., with seniority Oct. 25th.

N. S. Lott entered as Proby. Flight Officer, for temp. service, to date Oct. 29th.

Admiralty, October 28th.

The following have been entered as Proby. Flight-Sub-Lieuts. for temp. service, to date as stated: A. F. MacDonald, Sept. 5th; F. MacP. Bryans and C. E. S. Lusk, Sept. 26th.

Royal Flying Corps (Military Wing).

London Gazette, October 24th.

Squadron Commanders.—From Flight-Commanders, and to be Temp. Majors whilst so employed:—Oct. 1st: Lieut. (Temp. Capt.) G. L. P. Henderson, S.R.; Lieut. (Temp. Capt.) A. C. Wright, S.R.

Staff Officer, 2nd Class (graded for Pay as a Brigade Major).—Temp. Capt. F. R. Hedges, Gen. List, from an Adjutant; Oct. 7th.

Assistant Experimental Officer (graded as an Equipment Officer, 3rd Class).—Temp. Lieut. H. L. Billinton, Lan. Fus., and to be transfd. to Gen. List; Aug. 15th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. G. S. Steel, Gen. List; Sept. 18th. Sept. 22nd: Temp. 2nd Lieut. L. Norris, Gen. List; Temp. 2nd Lieut. J. B. Waddoup, Gen. List. Oct. 5th: 2nd Lieut. (on prob.) R. Donald, S.R.; 2nd Lieut. (on prob.) S. S. Kaye, S.R.; 2nd Lieut. J. D. Campion, S.R.

Memoranda.—2nd Lieut. (on prob.) E. G. C. Quilter, from R.F.C., S.R., to be Temp. 2nd Lieut. on Gen. List for duty with R.F.C.; July 18th. The under-mentioned to be Temp. 2nd Lieuts., for duty with R.F.C.:—Sept. 9th: 2nd Air-Mech. E. H. Channon, from R.N.A.S.; 1st Air-Mech. R. G. C. Pinfield, from R.N.A.S.; 2nd Air-Mech. H. W. Ingram, from R.N.A.S. The under-mentioned to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.: Coy.-Qr.-Mr.-Sergt. T. Allen, from Bord. R. (T.F.); Sept. 3rd. Qr.-Mr.-Sergt. J. W. Jennings; Sept. 10th. The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.:—Sept. 10th: C. E. Tebbs, C. H. Simpson, R. W. Atchley, H. Haddon, J. C. Courtice, R. L. Cobb, H. Stansfield, K. A. Smith, L. L. W. Smythe and F. Ward.

Supplementary to Regular Corps.—The under-mentioned resign their commissions:—Oct. 25th: 2nd Lieut. W. A. Spratt, 2nd Lieut. (on prob.) C. A. Mader. The under-mentioned to be 2nd Lieuts. (on prob.): R. Donald; Aug. 31st. L. M. Archibald; Oct. 6th. H. Wilson; Oct. 8th. F. H. Tyas; Oct. 9th.

London Gazette Supplement, October 25th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: Temp. 2nd Lieut. P. G. Horswell, Gen. List; Oct. 10th. 2nd Lieut. P. A. Byrne, R.A.; Oct. 14th. Capt. H. J. F. Hunter, Rif. Brig., from a Flying Officer; Oct. 17th.

Flying Officers.—Temp. 2nd Lieut. A. R. M. Rickards, Gen. List; Oct. 4th. Oct. 6th: Temp. 2nd Lieut. E. G. S. Wagner, R. War. R.; Temp. 2nd Lieut. G. F. Haseler, R. W. Surr. R., and to be transfd. to Gen. List. Oct. 7th: 2nd Lieut. R. M. Foster, R. Fus., and to be secd.; 2nd Lieut. F. H. O'Beirne, S.R.; 2nd Lieut. G. B. Pratt, R.A., and to be secd. Oct. 8th: 2nd Lieut. (on prob.) H. W. Norman, S.R.; Temp. 2nd Lieut. C. M. White, Gen. List. 2nd Lieut. D. Ransom, 12th Australian Inf. Bn.; Oct. 10th.

Equipment Officer, 2nd Class.—Lieut. E. S. Bramham, S.R., from an Asst. Equipment Officer; Oct. 11th.

Equipment Officers, 3rd Class.—2nd Lieut. W. R. G. Atkins, S.R.; June 19th. Temp. 2nd Lieut. F. H. Hawksford, Gen. List; Sept. 20th. Temp. 2nd Lieut. J. A. Payne, Gen. List; Sept. 25th. 2nd Lieut. A. N. Greg, R. War. R. (T.F.), from a Flying Officer (Ob.); Oct. 9th.

Memorandum.—Lieut. W. Hardcastle, from a Cadet Bn., R. War. R., to be Temp. 2nd Lieut. (on prob.), for duty with R.F.C.; Aug. 24th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. to be Lieuts.:—Oct. 1st: L. F. Hursthouse, (Temp. Capt.) H. B. T. Childs, (Temp. Capt.) G. S. Sansom, (Temp. Capt.) A. C. Gilling, C. St. Noble, B. V. Grealy, R. P. J. M'Coy, V. F. P. Bryce, S. Ransom, G. L. Godden. W. F. Anderson, from Lieut., Gen. List, Canada, to be Lieut.; Oct. 1st. 2nd Lieut. (on prob.) C. H. White resigns his commission; Oct. 26th.

London Gazette Supplement, October 27th.

Adjutants.—Temp. 2nd Lieut. S. O. Barnsdale, Gen. List, from a Flying Officer, and to be Temp. Lieut. whilst so employed, vice Temp. Capt. G. C. Anne, Yorks. L.I. (T.F.); Oct. 8th. Major M. Freeman, Worc. R., S.R.; Oct. 12th.

Equipment Officer, 3rd Class.—2nd Lieut. (on prob.) (now Temp. Hon. Lieut.) E. A. Salt, S.R., from July 1st to Aug. 31st. Acting Sergt.-Major H. C. S. Bullock to be 2nd Lieut., for duty with R.F.C.; Oct. 19th. The under-mentioned to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.:—Sept. 10th: Cadet S. F. Barton, Sergt. J. S. Berdoe, Cadet N. H. Knock.

Supplementary to Regular Corps.—The under-mentioned resign their commissions:—Oct. 27th: 2nd Lieut. R. L. Burdon-Saunderson, 2nd Lieut. (on prob.) T. A. J. Guyatt, 2nd Lieut. (on prob.) L. W. Wood. The under-mentioned to be 2nd Lieuts. (on prob.): W. W. Hall; Aug. 22nd. M. J. James; Sept. 6th. R. R. Prentice; Oct. 9th. R. Clelland; Oct. 16th.

London Gazette, October 28th.

Staff Captains.—Lieut. A. J. Child, Lond. R. (T.F.), from Adjt., R.F.C., and to be Temp. Capt. whilst so employed, vice 2nd Lieut. T. M. McKenna, 8th Hrs., S.R.; Aug. 23rd.

Flying Officers (Observers).—Temp. Lieut. C. H. Brewer, Bedf. R.; Sept. 1st. Temp. Lieut. E. W. Greswell, Ches. R., and to be transfd. to Gen. List; Sept. 25th. 2nd Lieut. G. L. Owen, E. Lan. Brig., R.F.A. (T.F.); Sept. 26th. Oct. 3rd: 2nd Lieut. G. R. Bolitho, Devon R., S.R., and to be secd.; Temp. 2nd Lieut. (on prob.) W. H. Buckeridge, Gen. List. Lieut. E. T. Owles, R. Ir. Fus., S.R., and to be secd.; Oct. 4th. Lieut. (Temp. Capt.) J. L. Head, Lond. R. (T.F.); Oct. 5th. Oct. 8th: Temp. Lieut. W. R. G. Pearson, A.S.C., and to be transfd. to Gen. List; Lieut. S. P. Gamon, Ches. R. (T.F.); 2nd Lieut. (Temp. Lieut.) W. R. Haggas, N. Lan. R. (T.F.); Temp. 2nd Lieut. C. C. Miller, W. Rid. R.; Temp. 2nd Lieut. R. W. Follit, R.A., and to be transfd. to Gen. List; 2nd Lieut. R. A. Wingfield, R. Ir. Fus., and to be secd.

Equipment Officer, 2nd Class.—2nd Lieut. C. G. Coe, S.R., from an Asst. Equipment Officer, and to be Temp. Lieut. whilst so employed; Sept. 30th.

Adjutants.—Lieut. F. S. Isaac, Worc. R., S.R., and to be secd., vice Lieut. (Temp. Capt.) A. J. Child, Lond. R. (T.F.); Sept. 21st. Lieut. H. French, W. York. R., S.R., from a Flying Officer (Ob.); Sept. 27th.

Memorandum.—The notification in the *Gazette* of Aug. 24th, 1916, regarding Temp. Hon. Capt. G. B. Cockburn is cancelled.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) H. W. Norman is confirmed in his rank. The appointment of 2nd Lieut. (on prob.) E. A. Salt, notified in the *Gazette* of July 17th, 1916, is antedated to June 14th, 1916.

London Gazette Supplement, October 28th.

Flying Officers (Observers).—Oct. 10th: Temp. 2nd Lieut. R. J. G. Temple, R.A., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) A. J. Cathie, Gen. List.

Supplementary to Regular Corps.—2nd Lieut. H. H. Burt resigns his commission; Oct. 29th. The under-mentioned 2nd Lieuts (on prob.) are confirmed in their rank: C. Crawford, A. D. Robertson, A. E. Biggs, W. P. Bingham.

London Gazette Supplement, October 30th.

The under-mentioned to be 2nd Lieuts., for duty with R.F.C.: Pte. C. P. Lowry, from Can. Army Med. Corps; Aug. 27th. Armr.-Staff-Sergt. J. Allan, from Can. Ord. Corps; Sept. 19th. Sept. 27th: Sergt. W. Steer, from Lond. R. (T.F.); Sergt. H. J. H. Dicksee, from Lond R. (T.F.); Sergt. J. L. Denman, from Can. Forces; Corpl. H. Brooks, from Can. Inf.; Pte. L. N. Smith, from Can. Inf.; Pte. A. W. Waddy, from a Can. Divl. Supply Col. Corpl. G. H. Boorne, from a Can. Divl. Sig. Co.; Sept. 28th. Oct. 3rd: Corpl. J. K. Campbell, from a Can. Sig. Co.; Pte. H. Ritchie, from Can. A.S.C. Oct. 6th: Mech. Sergt.-Major G. E. Bower, from A.S.C.; Flight-Sergt. S. Frost, from R.F.C.; Acting Sergt. W. A. L. Spencer, from A.S.C.; Acting Bdr. A. C. Heaven, from Machine Gun Corps; L.-Corpl. F. Young, from Cyclist Bn. (T.F.); L.-Corpl. E. R. Stewart, from Can. Sig. Serv.; Pte. O. G. Durham, from Can. Corps Cav. Regts. Oct. 9th: 1st Cl. Air-Mech. C. J. Geddes, from R.F.C.; 2nd Air-Mech. L. E. Yeomans, from R.F.C.; 2nd Air-Mech. W. Le Lorraine, from R.F.C.

Squadron Commander.—Capt. B. F. Moore, R. War. R., from a Flight-Com., and to be Temp. Major whilst so employed; Oct. 1st.

Flying Officers.—2nd Lieut. J. G. B. Baines, R. War. R., and to be secd.; Sept. 22nd. Oct. 4th: 2nd Lieut. C. G. H. Winter, S.R.; 2nd Lieut. E. B. Smyth, S.R.; 2nd Lieut. J. C. Young, S.R. Oct. 8th: Lieut. S. E. Goodwin, L'pool R. (T.F.); Temp. 2nd Lieut. K. A. Meek, W. York. R., and to be transfd. to Gen. List; 2nd Lieut. E. Jacot, S.R. Oct. 9th: 2nd Lieut. A. Winks, N. Mid. Div. Cyclist Cos., Divl. Mtd. Troops (T.F.): Temp. 2nd Lieut. (on prob.) R. D. Baker, Gen. List. Oct. 10th: Temp. Lieut. C. F. Eckel, Dorset R., and to be transfd. to Gen. List; 2nd Lieut. (Temp. Lieut.) C. Dunlop, 1st Lovat's Scouts Yeo. (T.F.); Temp. 2nd Lieut. T. B. Bruce, Gen. List; 2nd Lieut. C. Crawford, S.R. Oct. 11th: Temp. 2nd Lieut. R. B. Wainwright, attd. 17th Lrs.; 2nd Lieut. J. R. Statter, Som. L.I., S.R., and to be secd.; 2nd Lieut. J. E. H. Bibby, R.W. Fus., and to be secd.; Lieut. J. G. L. Brown, R.F.A., S.R.; Temp. Lieut. J. Glover, R.A., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) J. W. Somers, Gen. List; 2nd Lieut. (Temp. Lieut.) C. McC. H. M. Caffyn, E. Surr. R., and to be secd.; Capt. L. W. Hopkins, 21st Canadian Inf. Bn.; Temp. 2nd Lieut. D. M. Faure, Gen. List, from a Flying Officer (Ob.), with seniority from Apr. 23rd; 2nd Lieut. J. D. Cowie, Arg. and Suth'd. Highrs. (T.F.); Temp. 2nd Lieut. C. A. Sutcliffe, Gen. List. Oct. 12th: 2nd Lieut. A. Jennings, R.A., and to be secd.; 2nd Lieut. F. A. Swoffer, Middx. R. (T.F.). 2nd Lieut. S. Collier, Ches. R. (T.F.); Oct. 14th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. (on prob.) W. Hardcastle, Gen. List; Sept. 18th. Oct. 4th: 2nd Lieut. M. Keegan, R. Dub. Fus.; Temp. 2nd Lieut. W. B. Everton, Gen. List; Temp. 2nd Lieut. A. S. Morris, Gen. List; Temp. 2nd Lieut. T. E. Drowley, Gen. List; Temp. 2nd Lieut. H. McKenna, Gen. List; 2nd Lieut. J. Kemper, S. Lan. R.

Asst. Experimental Officer (graded as an Equipment Officer), 3rd Class).—2nd Lieut. F. W. Musson, N. Lan. R. (T.F.); Sept. 12th.

Memoranda.—The under-mentioned 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: E. Robinson, R.A.; H. M. T. Lehmann, Essex R.; S. A. Villiers, R.A.; E. L. Benbow, R.A.; R. L. Chidlaw-Roberts. Hamps. R.; A. H. Bottrell, R. War. R. The under-mentioned 2nd Lieuts., S.R., to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: M. H. Turner, Dorset R.; J. B E. Crosbie, Worc. R.; N. M. Hoskins, N. Staff. R.; C. de.W. Taylor, 20th Hrs.; A. H. Francis, R. Suss. R.; (now Lieut). A. R. Johnston, High. L.I.; N. Howarth, R. Lanc. R.; G. Aste, A.S.C.; H. S. MacNeil, R.F.A.; A. P. V. Daly, Conn. Rang. The under-mentioned Temp. 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C.:—Sept. 1st: C. H Stocks, R. H. Sievwright, G. K. Palmer, E. C. Winkley, J. A. Simpson, S. H. Ellis, G. F. Westcott, G. A. Thompson, J. S. Anderson, A. L. Findlay, A. M. Walters, L. R. Heywood, F. E. Sedgwick, C. A. Brewster-Joske, H. T. Shaw, R. J. Sanceau, J. McArthur, K. F. Balmain, W. S. De Ropp, O. Hughes, L. J. Mann, H. A. Arbuthnot. The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Pte. J. C. Griffith, from N. Zealand Expeditionary Force; Sept. 11th. L.-Corpl. L. Legge; Oct. 11th. Flight-Sergt. P. A. Rich, from R.F.C., to be Temp. 2nd Lieut. (on prob.), for duty with the Military Wing of that Corps; Oct. 1st.

Supplementary to Regular Corps.—N. C. F. Francis, from 2nd Lieut. (Temp. Lieut.) London Brig., R.F.A. (T.F.), to be Lieut.; Oct. 4th. 2nd Lieut. D. Cox resigns his commission on account of ill-health; Oct. 31st. 2nd Lieut. (on prob.) R. Baltus resigns his commission; Oct. 31st. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. Jacot, C. G. H. Winter, J. C. Young, E. B. Smyth, T. McC. Yarwood, A. C. Blackmore, F. H. Postlethwaite, S. S. Kaye. The under-mentioned to be 2nd Lieuts. (on prob.): W. H. R. Skudder; Sept. 4th. W. A. Haslam; Oct. 11th.

Schools of Instruction.

London Gazette Supplement, October 31st.

Assistant Commandants, Staff Officers, 2nd Class (graded for Pay as Brigade Majors).—Sept. 19th: Temp. Major A. E. G. MacCallum, Gen. List, from a Park Comdr.; Lieut. (Temp. Capt.) S. W. Smith, R.A., from a Flight-Comdr.

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Air Work in the Soudan.

In the despatch published in the *London Gazette* of October 25th, describing operations against Ali Dinar, the Sultan of Darfur, in the early part of this year, General Sir Reginald Wingate, Sirdar and Governor-General of the Soudan, says that the conduct and efficiency of the men of the Royal Flying Corps placed at his disposal by the Commander-in-Chief in Egypt, fully upheld their splendid reputation.

In detailing the fighting for El Fasher, General Wingate says:—" At 6 a.m., when the troops were about to advance, some hundreds of the enemy to our left flank were dispersed by artillery and Maxim fire and bombed by aeroplane. At 10 a.m. Colonel Kelly, with the mounted troops, entered El Fasher, which was found to be almost deserted except by women.

" Sultan Ali Dinar, on receipt of the news of the crushing defeat at Beringia, made a final effort to rally the remainder of his army to the attack in the early morning of the 23rd, and subsequently fled with some 2,000 men, who were bombed as they emerged from the south end of the town by Lieutenant J. C. Slessor, Royal Flying Corps, in the course of a gallant and successful flight."

It will be realised, points out General Wingate, that a most careful and comprehensive organisation was required to convey some 3,000 men, with stores, guns, aeroplanes and other bulky equipment of a modern expeditionary force, from the base at Khartoum (500 miles by rail from the nearest seaport) to railhead 428 miles away and thence across a desolate tract of roadless country for nearly 400 miles.

Among those commended by General Wingate for their services in connection with the military operations and the situation in the Soudan created by the war are:—

Royal Flying Corps.—Lieut. (Temp. Major) E. J. Bannatyne, 19th Hussars; Major (Temp. Lieut.-Col.) P. R. C. Groves, Shropshire L.I.; Lieut. J. C. Slessor, Spec. Res.. 2197, Flight Sergt. F. Batty; 3724, Sergt. H. A. Hemming; 3682, 1st Class Air Mechanic T. Horton; 4745, Pte. G. Maddams, A.S.C.

HONOURS.

Honours for the R.N.A.S.

In the list of naval honours published in a supplement to the *London Gazette* on October 25th, appeared the following:—

The King has been graciously pleased to give orders for the appointment of the under-mentioned officers to be Companions of the Distinguished Service Order:—

Flight-Lieut. Colin Roy Mackenzie, R.N.A.S.

In recognition of his skill and gallantry in destroying a German kite balloon on September 7th, 1916, under very severe anti-aircraft fire.

Distinguished Service Cross.

The King has also been graciously pleased to approve of the award of the Distinguished Service Cross to the under-mentioned officers:—

Flight-Commander Tom Harry England, R.N.A.S.

In recognition of his services on August 26th, 1916, when, accompanied by a military officer as Observer, he flew a seaplane 43 miles inland from the Syrian Coast, crossed a range of hills 2,000 ft. high, with clouds at 1,500 ft., and after dropping bombs on the station of Homs, returned safely to his ship. The machine was exposed to rifle fire at extremely low altitudes for long periods, and Flight-Commander England showed remarkable pluck, determination and skill in carrying out the flight under adverse conditions.

Flight-Lieut. Charles Teverill Freeman, R.N.A.S.

In recognition of the gallantry and skill displayed by him on the night of August 2nd, 1916, when he made a determined attack on a Zeppelin at sea, only abandoning the attack when he had exhausted all his ammunition. As darkness was approaching at the time, and his chances of being picked up were problematical, his courage and devotion in returning to the attack a second and third time were exemplary.

Flight-Sub-Lieut. Stanley James Goble, R.N.A.S.

In recognition of his services on September 24th, 1916, when he attacked two hostile machines in the vicinity of Ghistelles at close range, and brought one of them down on fire in a spiral nose-dive.

Flight-Sub-Lieut. Ronald Grahame, R.N.A.S.

For exceptional gallantry in attacking and beating off four enemy seaplanes whilst on escort duty off the Belgian coast on September 22nd, 1916.

Flight-Sub-Lieut. Daniel Murray Boyne Galbraith, R.N.A.S.

In recognition of his services in attacking a large enemy two-seater seaplane on September 28th, 1916. Flight-Sub-Lieut. Galbraith's machine was severely damaged by gunfire from the enemy machine, which finally blew up in the air.

Medals for the R.F.C.

A special supplement to the *London Gazette*, issued on October 27th, announced that His Majesty the King had been graciously pleased to award the Military Medal for bravery in the field to the undermentioned non-commissioned officers and men. It is explained that, as the medals have been awarded for services rendered on various occasions during the progress of the campaign, the ranks now shown are not in all cases those held by the recipients when the acts of gallantry were performed:—

2202	Corpl. S. Attwater, R.F.C.
2916	Corpl. J. E. Beddows, R.F.C.
897	Flight Sergt. W. G. Borrett, R.F.C.
1863	Sergt. C. Brown, R.F.C.
1305	1st Air-Mech. J. S. Clark, R.F.C.
413	Flight Sergt. C. I. Collett, R.F.C.
2126	Sergt. A. R. Edwards, R.F.C.
4708	1st Air-Mech. E. C. Gill, R.F.C.
45311	2nd Air-Mech. J. J. Hollyhead, R.F.C.
25076	2nd Air-Mech. (acting Corpl.) P. H. Marshall, R.F.C.
1649	Corpl. W. N. Mayger, R.F.C.
2137	Sergt. H. Monks, R.F.C.
7330	2nd Air-Mech. T. Murray, R.F.C.
4882	2nd Air-Mech. H. S. Porter, R.F.C.
2594	Sergt. A. H. Read, R.F.C.
792	Flight Sergt. F. J. Smith, R.F.C.
2551	1st Air-Mech. F. Thomasson, R.F.C.
364	Flight Sergt. (Acting W.O.) G. Thornton, R.F.C.

* * *

British Flyers in Roumania.

Messages from Bucharest state that on October 27th four British machines, each with two pilots, reached the Roumanian capital from Imbros making the 312 mile journey in five hours. It is also stated that 128 French aeroplanes had arrived in Roumania.

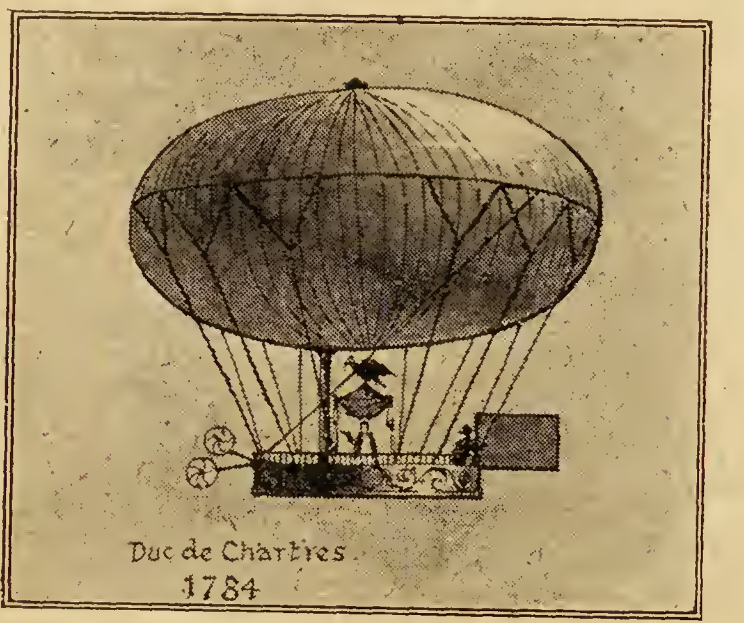
The *Times* correspondent in Bucharest, writing on the previous day, stated that a British aeroplane, piloted by Lieut. Harvey, left the island of Tenedos yesterday morning and arrived here this afternoon, after passing over Thrace and the Bulgarian town of Adrianople. His unexpected appearance caused a scare here, and the alarm was given in the usual way. Five other aeroplanes left Tenedos at the same time, and four are reported to have arrived in other parts of Roumania. Lieut. Harvey, while flying low, was attacked by Bulgarian artillery, but escaped injury.

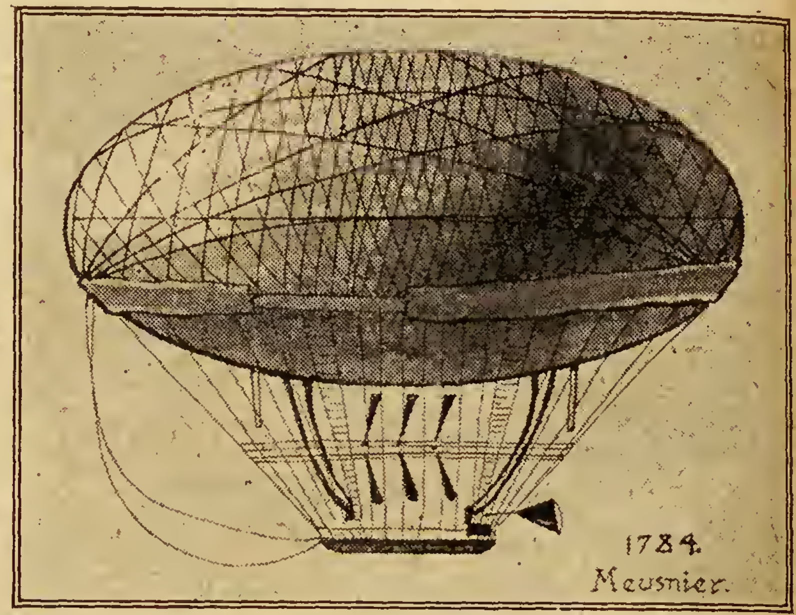
Incidentally there has been a cessation of aerial attacks on Bucharest for the past few weeks.

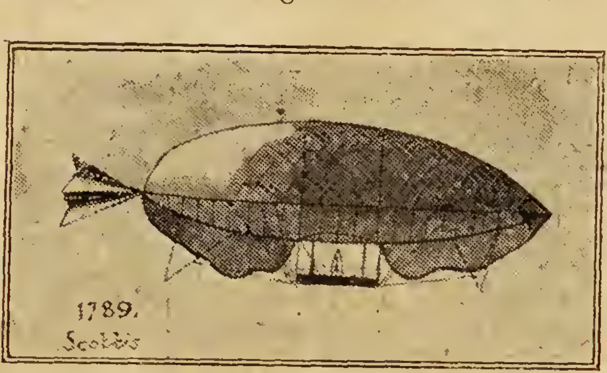
The finish of an awkward near cut home.—An incident at one of our aerodromes.

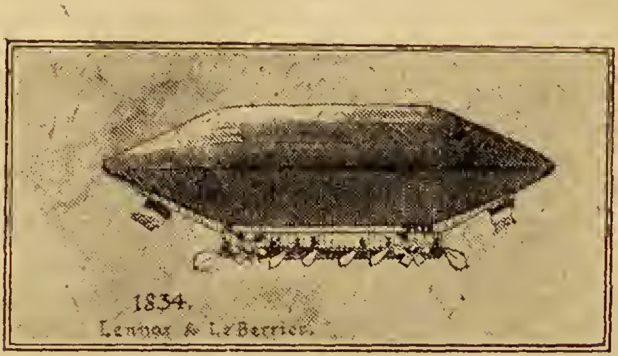
AIRSHIP PIONEERS

With the exception of those closely in touch with aeronautics, there are probably few people who know or realise the great number of attempts which have been made to produce a successful airship. By way of supplementing therefore the *résumé* of Zeppelin development and the details of "L. 33," one of the latest German productions, which appeared in our last issue, we have prepared an historical survey giving particulars and illustrations of airships which have been built and tried. We have purposely refrained from including any and every project for an airship which has been put forward at any time and have only included those which have actually materialised. Owing to the extensive nature of the subject it has been impossible to include the whole in one issue, and so the present instalment ends with the Barton airship of 1904. In our next issue we shall continue, tracing the development of the modern types of airships in various countries.



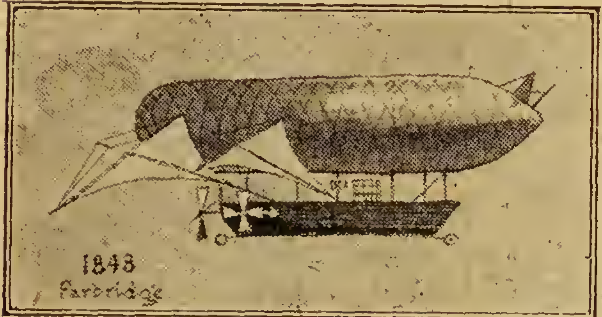


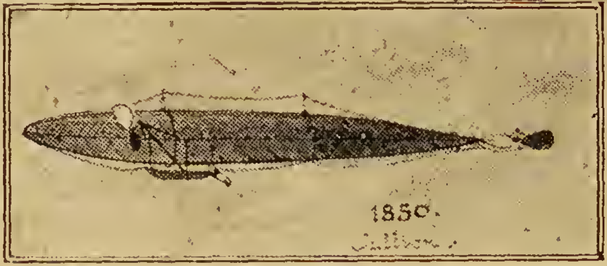


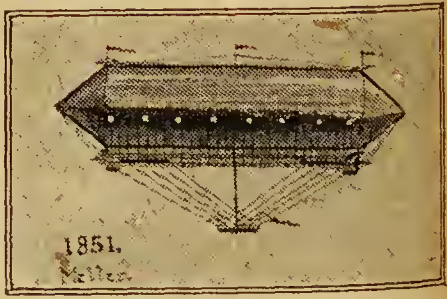


When once it was demonstrated by the brothers Montgolfier in 1783 that a spherical body filled with hot-air or hydrogen or similar light gases, could rise into the air and support a load, it was only to be expected that the idea of the dirigible balloon at once presented itself. Gas-filled envelopes had already proved their superiority over hot-air ones, and so were adopted accordingly, but it was at once conceived that cylindrical or similarly shaped envelopes would be far more suitable for steering purposes than spherical or pear-shaped balloons. The only means of propulsion that suggested itself at first was by manually operated oars, and so, just a year after the début of the balloon, the first dirigible materialised on these lines. In 1784 the Brothers Robert, two clever mechanics of Paris, who built the first gas-inflated balloon to carry passengers, constructed this dirigible for the Duke de Chartres. The envelope was ellipsoidal in shape, measuring 52 ft. long and 32 ft. deep, and had a capacity of 30,000 cubic ft. On the suggestion of General Meusnier, an outer envelope was provided to prevent loss of gas. Suspended below the envelope was a car from which the oars were operated. The first ascent was made on July 6th at St. Cloud with the Duke, the two Roberts and another on board. No provision had been made for the escape of gas as it expanded when ascending, and the envelope was upon the point of bursting when the Duke forced a hole through it with a flagstaff and thus prevented a disaster.

A safe descent was made and steps were immediately taken to remedy this defect. Two months later a second ascent was made with three up. An overflow outlet had been fitted and a rudder added, and although one of the three oars was accidentally broken, the airship covered an elliptical course, and a safe landing was effected a little later 118 miles from Paris.

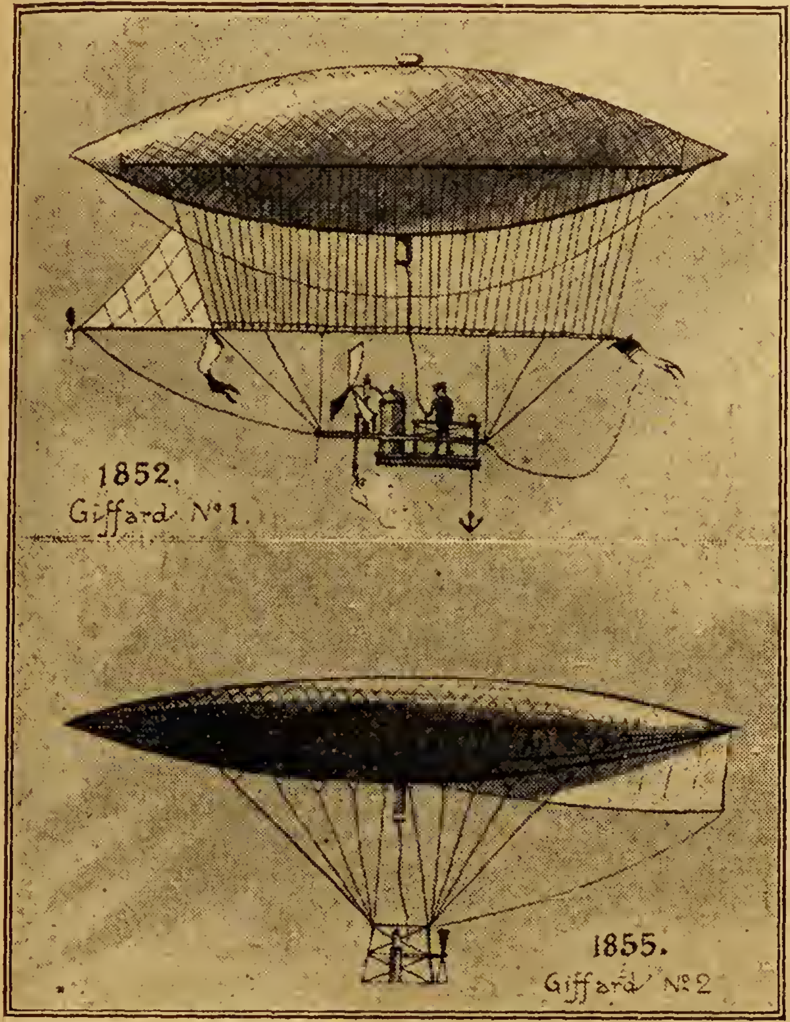






The same year General Meusnier designed an airship possessing several interesting features, the most important of which was the introduction of the "ballonet" system of regulating the pressure inside the envelope. The latter was double-surfaced, egg-shaped, with a strong rope net suspension supporting the car beneath. Between the car and the envelope were three propellers, mounted in diagonal rigging one behind the other, operated from the car by hand. Variation in direction was provided for by means of a rudder at the rear. To counteract the variation of pressure of the gas, air was forced in between the inner and outer envelope when the gas contracted and *vice-versa*.

Another interesting design was produced in 1789 by a Baron Scot who proposed a fish-shaped envelope containing a ballonet forward and two aft. These ballonets could be operated independently, thus varying the pressure at either end of the envelope, as desired. It was intended by the aid of these ballonets to alternately point the nose of the airship up and then down, and so obtain a forward motion through this see-saw action.


1852. Giffard No 1.

1855. Giffard No 2

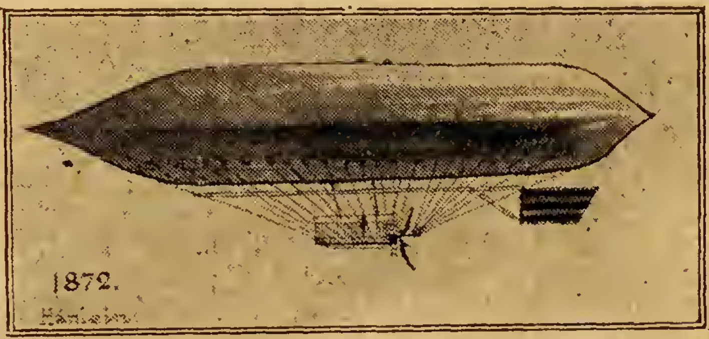
Comte de Lennox, of Paris, built an airship in 1834 which met with a very undignified end. This ship had a cylindrical envelope with conical ends, and was 130 ft. long by 35 ft. diameter. It was provided with a system of air ballonets for regulating the equilibrium of the ship. A long car was suspended immediately below the envelope, and contained accommodation for a large number of passengers. Propulsion was by means of some 20 oars, and four paddle wheels worked by men. On the day of the trial the ship refused to leave the ground, and was promptly destroyed by the onlookers.

During the latter part of the eighteenth and the early part of the nineteenth century numerous schemes for dirigibles (many of an impossible nature) were brought forward, but without success. Mention might be made, however, of one design carried out by an Englishman, J. M. Partridge, in 1848, which is interesting in that the cylindrical envelope consisted of a light rigid framework covered with fabric. The complete envelope was covered with a light wire netting from which the car was suspended. The car had three propellers at the stern, driven, we believe, by compressed air. Sails, or planes, were provided for steering purposes. A ballonet was used to regulate the variations of gas pressure. Several small trips were accomplished, but with little success as far as steering was concerned.

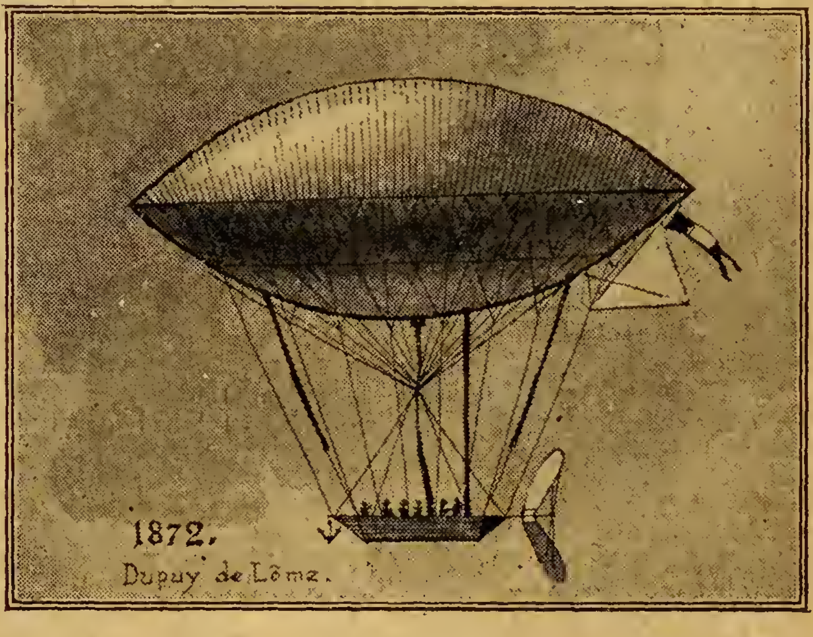
In 1850 Julien, of Paris, built a small model consisting of a long torpedo envelope with a boat-like car, suspended underneath near the nose, from which a propeller mounted high up on each side of the envelope was driven. Another interesting design was that of Meler (1851), who advocated the use of thin sheet metal for the envelope. He also had two cars suspended immediately under the body, one at each end, connected by a keel, from the centre of which was slung a third car that was intended to act as a shifting balancing ballast.

It was not until 1852 that the problem of the dirigible made any real advance. In this year, Henry Giffard, the inventor of the steam injector for boilers, constructed a steam-driven dirigible which attained a speed of about 6 m.p.h. in still air. The envelope was cigar shaped, 144 ft. long, and 40 ft. diameter, giving a capacity of 88,200 cubic ft., and was held within a net from which the leading lines extended to a horizontal pole running fore and aft ten feet below the envelope. From this pole was suspended a car containing the power plant. The latter consisted of a coke-fired boiler and a small engine driving an 11 ft. propeller. The power developed was 3 h.p. and the weight of the power plant was about 350 lbs. The envelope was fitted with an overflow outlet, and to provide against escaping gas reaching the fire of the boiler a wire gauze safety mask was fitted over the furnace door, and the chimney from the furnace was bent downwards so as to discharge the furnace gases beneath the car. Steering was effected by means of a vertical rudder flexibly mounted at the rear of the pole or keel.

In 1855 Giffard built another dirigible which gave rather better results. The envelope was much longer and narrower, measuring 230 ft. long by 33 ft. diameter, and having a capacity of 113,000 cubic ft. This time the car containing the steam plant—the same as before—was suspended directly from the leading lines of the net which was secured to a special stiffening covering on the upper part of the envelope. Underneath the envelope, from the stern to nearly the centre, there extended a triangular rudder. This airship proved somewhat faster than the previous model, and even succeeded in making progress, slowly it was true, against the wind. This ship was destroyed at the termination of the trial when about to land, the nose pointing upwards and the weight of the car causing the net to slip out of position and burst the envelope. Giffard and his companion, however, escaped with slight injuries, but nevertheless, no further experiments were carried out.

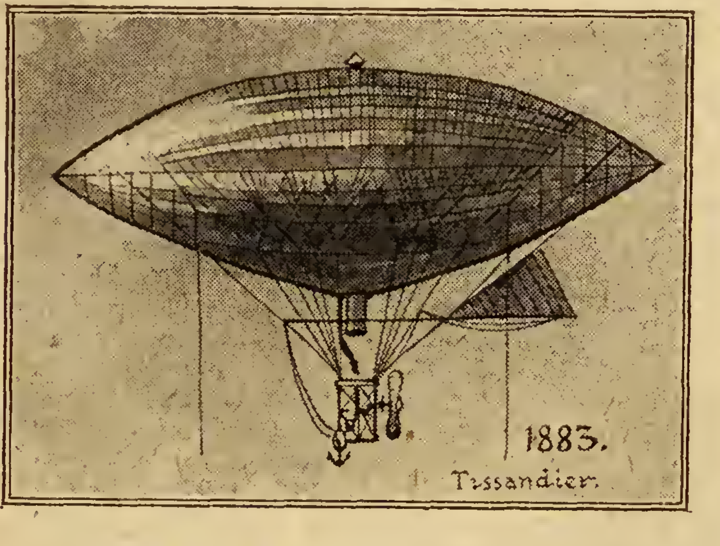

1872. Hanlein

During the siege of Paris in 1870, the French Government authorised M. Dupuy de Lôme, a naval architect, to construct a dirigible, but it was not until 1872 that the trials took place.

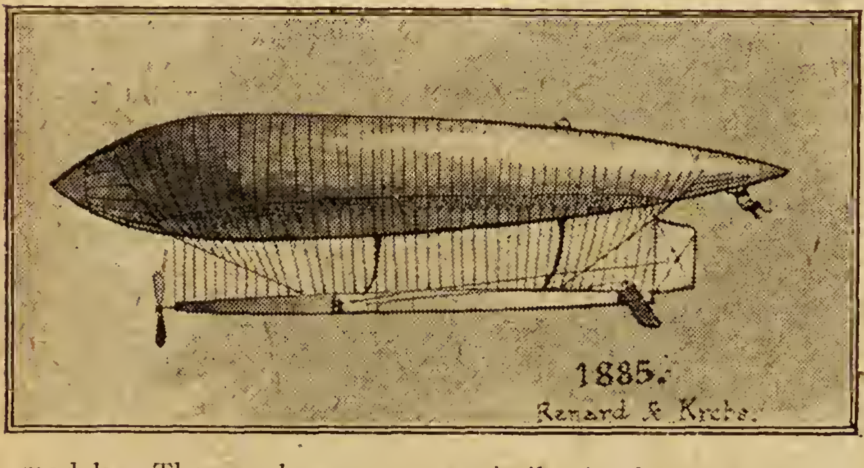

1872. Dupuy de Lôme.

De Lôme's airship had an envelope of much the same shape as Giffard No. 1, measuring 118 ft. long by 49 ft. diameter and having a capacity of 122,000 cubic ft. It was provided with a ballonet, and a boat-shaped car was suspended from the net by diagonally crossed, as well as vertical, leading lines which rendered the connection extremely rigid. A triangular rudder was attached to the rear of the envelope, and at the stern of the car was a propeller nearly thirty feet in diameter, with about 160 sq. ft. of surface, which was driven by eight men. With this 8 h.p. motor, a speed (in calm air) of six miles per hour was obtained !

In 1872 was also produced a dirigible—designed by a German, Paul Haenlein—which, in appearance at all events, was a nearer approach to the present-day dirigible than any of the previous designs. The envelope was long and cylindrical in shape, with conical ends, the nose being more pointed than the stern. It was 165 ft. long, 30 ft. diameter, and had 85,000 cubic ft. capacity, and was provided with a central ballonet. The car was strongly attached to the envelope by means of diagonally crossed lines attached to the envelope just below the equator line. The car suspension was further stiffened by a keel framework between the car and the envelope. At the rear of the car was a 15-ft. four-bladed propeller driven by a four-cylinder gas engine developing 3 h.p. The engine obtained its fuel from the coal gas contained within the envelope, the loss being made good by pumping up the air ballonet. The rudder was attached to the rear end of the keel. The speed attained in still air was 10 m.p.h.



The next airship of any note was that of the Brothers Tissandier, which was built in 1883, on data obtained from models. The envelope was very similar in shape to Lôme's, but was slightly smaller, being 92 ft. long by 30 ft. diameter, and 37,500 cubic ft. capacity. It was rendered more or less rigid by a wooden stay extending from point to point equatorially. The car, built up of bamboo, was suspended from a net, and contained a 1½ h.p. Siemens electric motor, driving a 9 ft. propeller, current being supplied by a bichromate battery. Speeds of 6 to 8 m.p.h. were obtained with this airship in more or less calm weather.

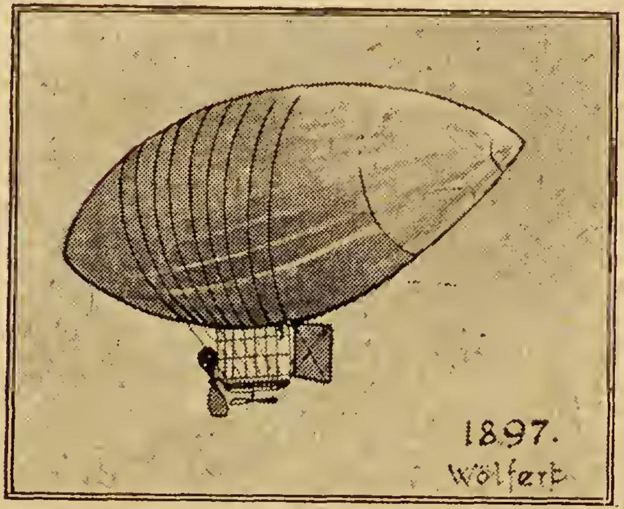


Another electrically propelled airship made its appearance the following year. It was built by MM. Renard and Krebs, and was certainly the most successful dirigible that had so far been produced. "La France," as it was called, had a cigar-shaped envelope, 165 ft. long, and 27 ft. maximum diameter at about one quarter length from the nose, and had a capacity of 66,000 cubic ft. It had a ballonet, and a net-covering from which a car 108 ft. long was very rigidly suspended by diagonal leading lines. The car, rectangular in section built up of bamboo and covered with silk, had at its forward end a tractor screw 23 ft. in diameter driven by a 9 h.p. Gramme electric motor, from a battery of chromium chloride cells.

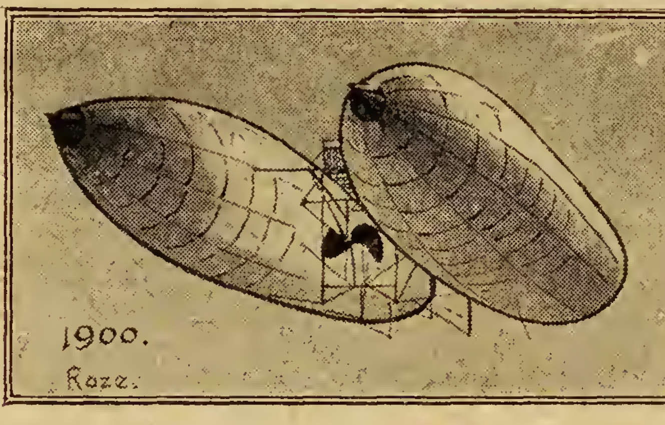
Mounted at the stern between the car and the envelope was a peculiarly shaped rudder, consisting of two four-sided pyramids placed base to base. A sliding weight was employed to assist in maintaining the fore and aft balance of the ship, and the tractor-screw blades were so arranged that they could be raised out of the way of the ground when a landing was being effected.

The first trials took place on August 9th, 1884, at Chalais-Meudon, when an out-and-home trip of five miles was successfully accomplished. Many other successful trips were achieved during the following 12 months, including a trip from Chalais to Paris and back. "La France" had a speed of 15 m.p.h. in calm air.

In 1880, Dr. Wölfert, and Herr Baumgarten, of Germany, carried out some experiments with a cigar-shaped dirigible driven by an 8 h.p. Daimler benzine motor. There were three cars of bamboo rigidly suspended from the envelope, and a screw was provided beneath the cars for vertical movement in addition to a screw for propulsion. The first trial was not successful, for the balance of the vessel was upset on ascending, causing the airship to crash to the ground. Wölfert and his companion were uninjured, and in 1896, the former carried out some further trials with a new ship, but he experienced trouble with the motor. In 1897 he fitted a benzine vaporiser to the engine, and made another ascent with a passenger. When at a height of 600 ft. the ship burst into flames and fell to the ground, killing both occupants.



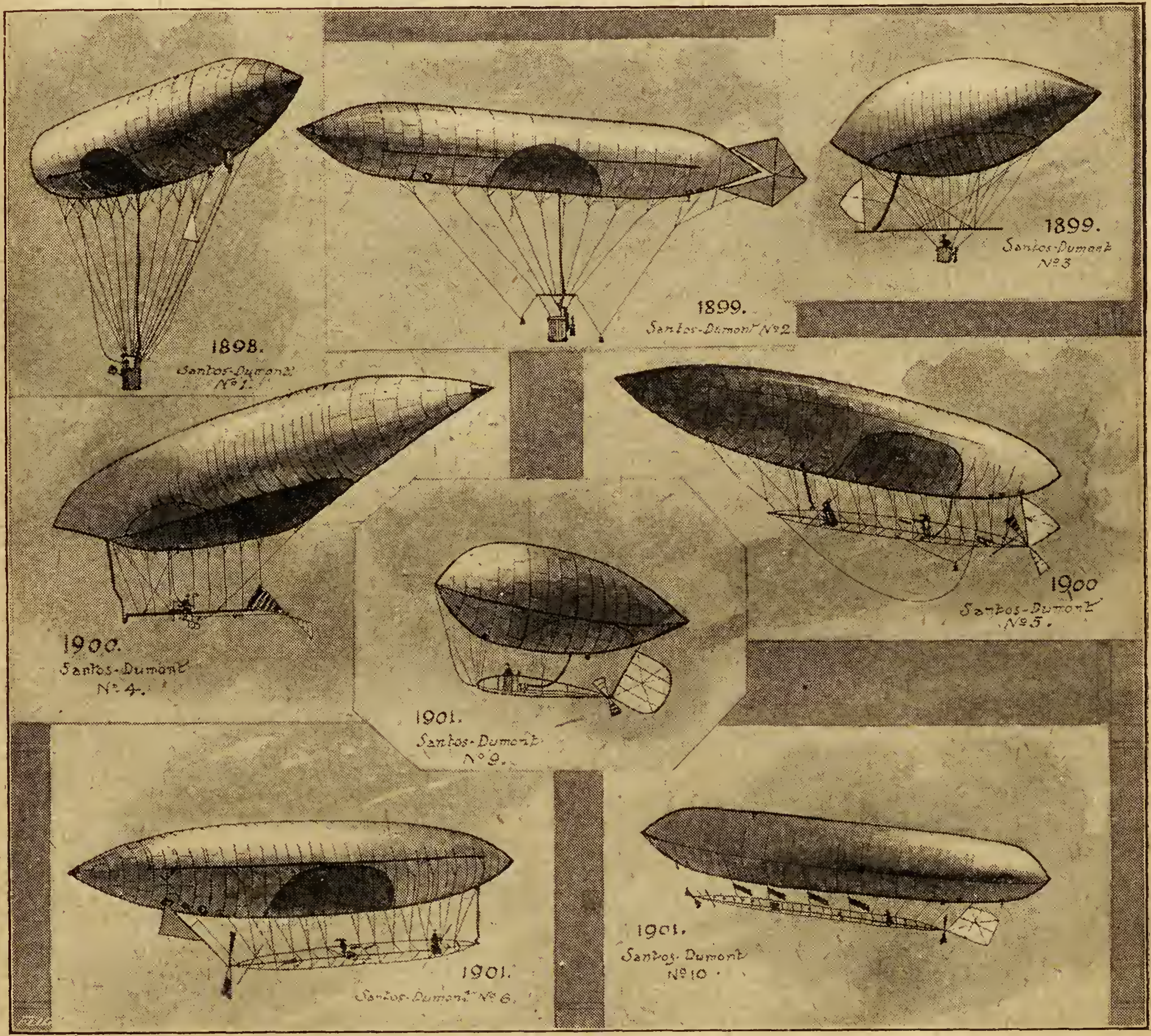
Next came the rigid aluminium dirigible of David Schwarz in 1895, referred to and illustrated in our last issue as the source of inspiration of Count Zeppelin. The cylindrical envelope had a conical nose and rounded stern ; it was of sheet aluminium, .008 in. thick, built up on a framework of the same material. The car was rigidly attached to the envelope framework, and contained a 12 h.p. Daimler motor driving three propellers by means of a belt. One propeller was mounted on each side of the envelope, and the third, for steering purposes, was at the rear of and above the car. The total weight of the ship was a little over three tons. A trial flight was carried out by the military at Berlin in 1897, Schwarz having died early that year. The ship ascended to about 800 ft., but could not make any headway against the wind. Eventually the driving belt came off the propellers and the ship was carried before the wind until the pilot opened the gas-valve and landed with slight damage. The wind and the spectators then completely wrecked the ship. Gas was introduced into the envelope in the following manner. Inside the envelope was a fabric lining which was



fully inflated with air. Gas was then forced in between the envelope and the lining, displacing the air from the latter, which, when empty, was withdrawn, leaving the envelope full of gas.

With the closing of the nineteenth century, the experiments of Zeppelin and Santos Dumont marked a new epoch, and there arose the nucleus of the airship as we know it to-day; a vessel capable of carrying out all that can be reasonably required of it.

The Zeppelin was fully dealt with in our last issue, and so we may proceed at once with the dirigibles produced by Santos Dumont. Up to 1901 he had built no fewer than 10 vessels, all more or less successful, and each succeeding one incorporating some improvement. No. 1, which made its first trial in September, 1898, had a cylindrical envelope with conical ends, 82 ft. long, 11½ ft. diameter, and 6,350 cubic ft. capacity. No net was employed, the suspension cords of the car or basket being attached to wood-stiffened hems sewn in the sides of the envelope. The motor, a 3 h.p. De Dion motor-cycle engine, was mounted outside and in the front of the car, and was coupled direct to a small two-bladed propeller. The envelope was provided with a pressure release valve and an air ballonet, fed by a pneumatic pump. Steering was effected by a silk-covered rudder mounted at the rear between the car and the envelope, whilst ballast weights, arranged for and aft, enabled the ship to rise and fall as desired. This little ship manœuvred well, and the only trouble experienced was with the ballonet, which was insufficient to retain the necessary rigidity of the envelope.

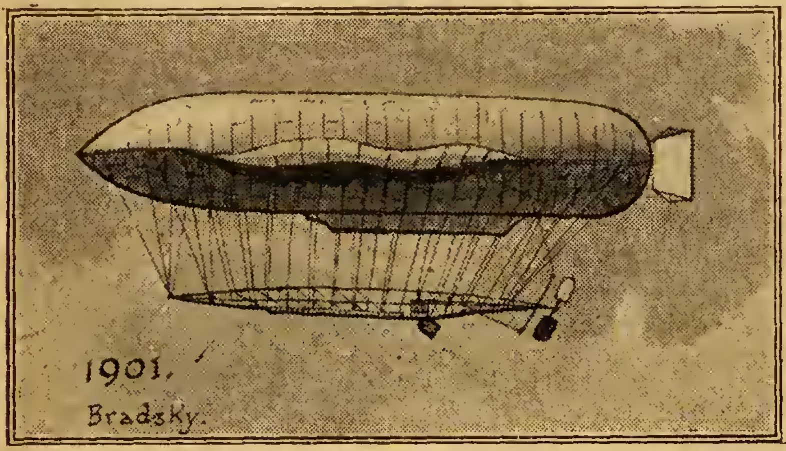


No. 2, which was built in 1899, was similar to No. 1, but was slightly larger in diameter, giving an extra capacity of seven hundred odd cubic ft. It was also improved as regards the ballonet, which, however, was again insufficient for the purpose, and the envelope doubled over on the first trial when the gas contracted during the ascent. In no way deterred, Santos Dumont built a third dirigible, which was completed six months later. No. 3 was of the same shape, but was much more stumpy, measuring 66 ft. in length by 24½ ft. in diameter, and having a capacity of 17,650 cubic ft. A bamboo keel was attached to the suspension lines, and from this keel the car was suspended. This arrangement made for greater rigidity, and also rendered it possible to dispense with the air ballonet and pump, whilst the larger capacity allowed ordinary coal gas to be used. The rudder was mounted as before, and balance weights slid along the keel. Many successful flights were made with this airship, including all kinds of evolutions and a flight round the Eiffel Tower. It was, however, somewhat clumsy and under-powered, so a fourth vessel was designed and made its appearance the following year. No. 4 differed considerably from the previous models, not only in the shape of the envelope, but in the arrangement of the keel, which now carried the motor—a 7 h.p. Buchet—and pilot, who sat on a kind of bicycle saddle.

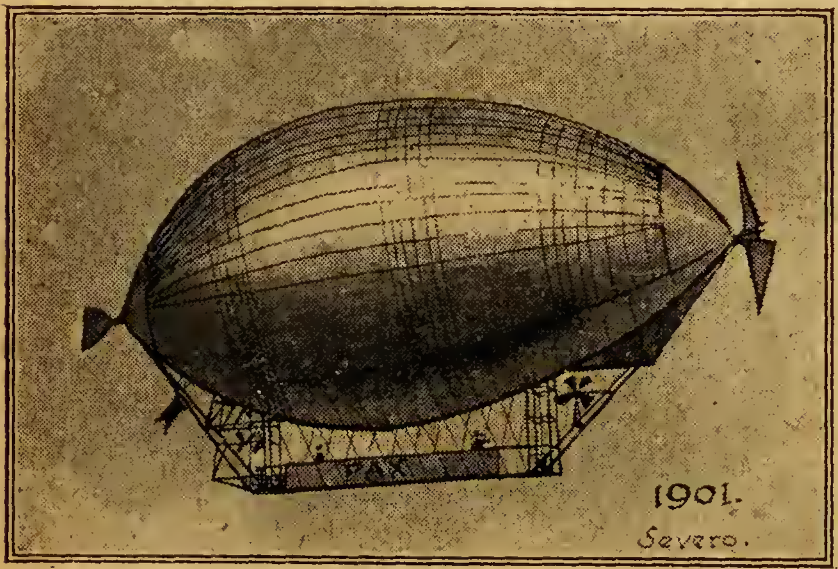
A tractor screw, mounted at the forward end of the keel, was also employed. An air ballonet and rotary pump and hydrogen were again employed.

Numerous successful flights were made on No. 4, which encouraged Santos Dumont to aim still higher, and so it was re-designed, and made its appearance shortly after with a new and larger envelope (109 ft. by 17 ft., capacity, 19,000 cubic ft.), a 12 h.p. Buchet motor, a built-up triangular-section keel of pine, piano-wire suspension, a propeller instead of a tractor screw, and water ballast. In other respects it followed the same general arrangement as No. 4. It was with this ship than an attempt was made to win the Deutsch de la Meurthe prize for a flight round the Eiffel Tower.

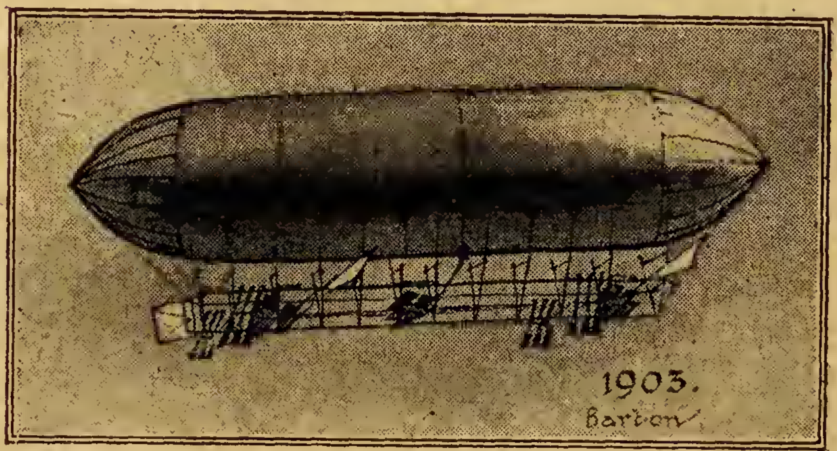
A series of accidents, terminating in the destruction of No. 5, however, prevented this feat from being accomplished, but a few months later the prize was won on No. 6. This ship was an improved No. 5, having a slightly larger capacity, but otherwise possessing the same features. After winning the £4,000 prize, Santos Dumont took No. 6 to Monaco, where he made numerous successful ascents over the Mediterranean, until ballonet trouble brought him down in the sea. In the meantime No. 7, a "racing" dirigible, was under construction. This had a double envelope, 164 ft. by 26 ft., capacity, 44,500 cubic ft. It was fitted with a 60 h.p. water-cooled engine, driving a tractor and a propeller screw situated at the front and rear of the keel respectively. Of the subsequent dirigibles turned out, perhaps the most interesting was No. 9, called the "Little Runabout," as it was the smallest one of the series.



The envelope was egg-shaped, measuring 50 ft. by 18 ft., capacity, 7,770 cubic ft. in its original form; later it was slightly enlarged. The keel, or car, contained a 3½ h.p. Clement motor, driving a propeller at the rear. It was extremely easy to manœuvre, and had a speed of about 12 m.p.h. No. 10 was a larger model of No. 7, and was called the "Omnibus" on account of it carrying several passengers. Several other airships were also built by M. Santos Dumont after this, all more or less on the same lines, but possessing minor improvements.



Before dealing with the twentieth century dirigible—the real, practical airship—reference may be made to four other efforts. In 1901 a French inventor named Roze built an original double airship. It consisted of two cigar-shaped envelopes placed side by side with a framework between carrying the engine, the propeller, and the car. In this way it was supposed that the pitching and rolling of the airship would be entirely eliminated. The trials of the ship, however, proved to be a failure. The following year two experiments, both of which ended in disaster, were made by Augusto Severo, a Brazilian, and Baron Bradsky-Laboun respectively. The former's airship consisted of a spindle-shaped envelope mounted saddle fashion on a large bamboo frame. At the bottom of this frame, below the envelope, was formed the car containing two Buchet motors of 12 and 24 h.p. respectively. The former engine was forward, and drove a tractor screw mounted on the top of the framework in line with the central axis of the envelope. The rear motor drove a propeller similarly mounted. Before the trial took place other propellers had been fitted on the car, but these, together with the two ballonets, were dispensed with at the last moment. An ascent was made from Paris, and about 15 minutes afterwards the expending gas burst the envelope and the machine fell from a height of about 500 ft., Severo and his mechanic being killed. The Bradsky airship had a long cylindrical envelope, 111 ft. long, by 20 ft. diameter. A wooden frame was attached to the envelope equatorially from nose to stern, and from this frame was suspended the keel or car, which was made of steel tube, and carried a 16 h.p. Buchet motor in the centre. This motor drove a propeller mounted at the rear of the keel. Accompanied by a mechanic the Baron ascended near Paris, but could make no headway against the wind, and when attempting to land the mechanic left his position by the engine and so upset the balance of the airship, causing the car to break away and dash the occupants to the ground.



Finally, in 1904, an Englishman, Dr. A. Barton, built a dirigible of comparatively large dimensions, and containing several interesting features. The envelope was 176 ft. long, by 43 ft. diameter, and contained the usual ballonets. A bamboo framework was attached to the envelope by steel cables. The framework carried two 50 h.p. Buchet motors, with their crank-shafts lying parallel with the keel, and transmitted through gearing and belt the drive to four sets of propellers.

Each set of propellers consisted of three pairs of blades mounted one behind the other, and situated on each side of the car, two forward and two aft. The drive also included large friction clutches, and each engine was under separate control. The horizontal balance of the airship was attained by means of water tanks placed fore and aft, water being transferred from one to the other as required. Elevation was obtained by means of a series of planes mounted at intervals along the framework. The Barton airship was tried at the Alexandra Palace in July, 1905, but did not come up to expectations owing to its imperfect controlability, with the result that it drifted away and was destroyed in landing.

(*To be continued.*)

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Narrow Escapes of the Kaiser.

APPARENTLY twice recently bombs from the air have narrowly missed putting a period to the Kaiser's life. A message from Zurich states that a train in which he was travelling was recently struck by a bomb and the engine-driver killed. The Berne correspondent of the *Corriere d'Italia* says that a house in which the Kaiser slept during his recent visit to the Western front was wrecked by a bomb from a French aeroplane a few minutes after the Kaiser, the Crown Prince and the Staff had left. It adds that practically all the Kaiser's personal effects, including several uniforms, were destroyed, together with a number of important documents, and some of the Kaiser's servants were killed.

THE FLYING SERVICES FUND—Administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Oct. 24th, 1916 ..	10,866	6	6
Collected at the Westland Aircraft Works, Yeovil (Fifty-fourth contribution)	0	18	6
Proceeds of Concert given by the Ratings of the Royal Naval Air Station, Killingholme, Lincs.	5	7	6
Staff and Workers of Gwynnes, Ltd. (Twenty-sixth contribution)	8	1	11
Total, October 31st, 1916	10,880	14	5

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Prisoners of War in Bulgarian hands.

Flight-Sub-Lieut. G. K. Blandy, R.N. (wounded).
Lieut. R. G. Blakesley, R.N.V.R. (uninjured).

Reported by the War Office:—

Killed.

2nd Lieut. R. Davis, R.F.C.
2nd Lieut. A. B. Drewery, R.F.C.
2nd Lieut. T. W. Nops, R.F.C.
Lieut. F. S. Rankin, Can. Eng., attd. R.F.C.
Lieut. N. MacL. Robertson, R.F.A. and R.F.C.
2nd Lieut. G. K. Welsford, R.F.C.

Previously reported Missing, now reported Killed.

Capt. J. O. Cooper, R.F.C.
Lieut. H. M. Corbold, R.F.C.
Lieut. O. V. Le Bas, R.W. Surreys and R.F.C.
Lieut. A. V. Oliver-Jones, R.F.A., attd. R.F.C.

Died of Wounds.

2nd Lieut. A. Cropper, Wiltshire and R.F.C.
Lieut. J. A. Stewart, R.F.C.

Wounded.

2nd Lieut. G. G. Callender, R.F.C.
2nd Lieut. M. J. Fenwick, R.F.C.
Capt. O. D. Filley, M.C., R.F.C.
2nd Lieut. P. C. Garratt, R.F.C.
2nd Lieut. I. M. Harris, King's R.R.C., attd. R.F.C.
Lieut. R. P. Harvey, Norfolk, attd. R.F.C.
2nd Lieut. A. Kock, R.F.C.
2nd Lieut. J. A. Simpson, R.F.C.
2nd Lt. F. Surgey, Cyclist Co. Divl. Mtd. Troops, and R.F.C.
2nd Lieut. W. B. Young, R.F.C.
45633 2nd Air Mech. S. C. Jenner, R.F.C.
27163 2nd Air Mech. E. Syme, R.F.C.
9782 2nd Air Mech. S. C. Taylor, R.F.C.

Missing.

2nd Lieut. W. Black, Durham L.I. and R.F.C.
Lieut. W. P. Bowman, W. Yorks, attd. R.F.C.
2nd Lieut. P. A. Bryne, D.S.O., R.F.A., attd. R.F.C.
2nd Lieut. G. Clayton, W. Yorks, attd. R.F.C.
2nd Lieut. R. L. Dingley, Worcestershire and R.F.C.
Lieut. P. C. Ellis, Highland L.I., attd. R.F.C.
2nd Lieut. W. F. H. Fullerton, R.F.C.
2nd Lieut. C. C. Godwin, R.F.C.
2nd Lieut. C. C. Hann, R.F.C.
2nd Lieut. J. N. Holtom, R.F.C.
2nd Lieut. C. M. Kelly, R.F.C.
2nd Lieut. F. G. W. Marchant, R. West Kent and R.F.C.
2nd Lieut. J. K. Parker, R. Scots Fus., attd. R.F.C.
2nd Lieut. N. R. Pomeroy, R.F.C.
Capt. L. Porter, R.F.C.
2nd Lieut. J. L. Pulleyn, Dorset, attd. R.F.C.
2nd Lieut. A. B. Raymond-Barker, R.F.C.
2nd Lieut. C. L. Roberts, S. Lancs., attd. R.F.C.
2nd Lieut. G. B. Samuels, Durham L.I., attd. R.F.C.
2nd Lieut. A. L. M. Shepherd, King's R.R.C., attd. R.F.C.
2nd Lieut. T. G. G. Sturrock, R. Scots, attd. R.F.C.
Lieut. J. Thompson, R.F.C.
2nd Lieut. W. J. Thuell, R.F.C.
Capt. C. R. Tidswell, Dragoons and R.F.C.
Lieut. G. Wadden, R. Irish Fus., attd. R.F.C.
2nd Lieut. O. J. Wade, R. West Kent and R.F.C.
2nd Lieut. R. Watts, R.F.C.
2nd Lieut. W. T. Willcox, W. Yorks and R.F.C.
Lieut. W. H. N. Whitehead, Can. Cav., attd. R.F.C.
2nd Lieut. J. C. Wilson, Black Watch and R.F.C.
3049 Sergt. A. Clarkson.
6709 1st Air Mech. A. Grundy, R.F.C.

Previously Unofficially, now Officially, reported Wounded and Prisoner of War in German hands.

2nd Lieut. C. W. P. Selby, R. West Kent, attd. R.F.C.

Previously reported Missing, now reported Wounded and Prisoner of War in German hands.

2nd Lieut. A. F. A. Patterson, R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

Lieut. W. H. S. Chance, Worcester Regt. and R.F.C.
2nd Lieut. D. Cushing, R.F.C.
2nd Lieut. C. Geen, London and R.F.C.
2nd Lieut. C. J. Kennedy, R.F.C.
2nd Lieut. T. P. L. Molloy, Dorset and R.F.C.
2nd Lieut. J. K. Tullis, R.F.A. and R.F.C.
Lieut. R. D. Walker, R.F.C.
Capt. O. L. Whittle, S. Lancs. and R.F.C.

Previously reported Missing, now reported Prisoners of War.

10387 2nd Cl. Air Mec. T. N. Robinson, R.F.C.
1746 Sgt. G. Topliffe,, R.F.C.

Believed Taken Prisoner at Kut-el-Amara.

3388 2nd Cl. Air Mech. W. Fairhead, R.F.C.

Corrections: **Wounded.**

2nd Lieut. S. M. Smith, London and R.F.C. *should read* 2nd Lieut. H. S. Martin-Smith.

Missing and Prisoners of War in German hands, *should read* **Missing.**

2nd Lieut. A. Douglas, R.F.A. and R.F.C.
2nd Lieut. V. F. H. Hugill, R. Fus., attd. R.F.C.

Fatal Accidents.

At an inquest held on Lieut. R. C. V. Inkpen on October 24th, it was stated that while he was flying at a height of 80 ft. the machine side-slipped to the ground. The opinion was expressed that the deceased was trying to climb too steeply.

A verdict of "Death by Misadventure" was returned at an inquest on C. E. Tombs, an air-mechanic who was killed in an accident on October 23rd. He was acting as observer in a machine piloted by Lieut. Mytton, which became unmanageable and crashed to the ground, the pilot being severely injured.

Leonard Savage, 13, the son of a miner, was killed at Edlington, near Doncaster, on October 27th. At the inquest the evidence showed that Lieut. Kiddie, of the R.F.C., whilst flying from London to the North, alighted at Edlington Recreation Ground. On restarting his machine struck the deceased, killing him on the spot. The jury returned a verdict of "Accidental Death," and found that no blame attached to anybody in connection with the sad affair.

ARMCHAIR REFLECTIONS

BY THE "DREAMER"

I DREAM of the time when the aeroplane will be *tamped* out; when a few men will pull a few levers and a few other men will fuss around with dashboards already fitted up with instruments, plus a couple of wheels and a bit of sheet metal, and, behold, an aeroplane.

It is to J. M. Barrie we are indebted for the foreman compositor who knew "copy" by only two names, "News" and "Tripe," and I have sometimes wondered under which heading he would have placed the sheets of matter emanating from the clouds of steam given off from the wet towel surrounding the head of the "Dreamer." Yet I know what becomes of that "copy." I recognise above all others the footfall of the imp from below trudging up the stairs to my office, accelerating in the last few steps, and bursting in with "Copy, please Sir."

All the rush of a great business establishment is upon the shoulders of that imp. He must come and be gone before the smoke of his Woodbine can creep out from under the folds of his apron. His intimated impression is that all the vast personnel of that side of the business which is not "Editorial" await the coming of my sheets.

I know what happens to them, these pages of wonderful things. I am fully aware of the fate awaiting that which I might have fondly hoped would gain for me the inclusion of my portrait by Moreland in that wonderful gallery adorning the walls of the Press Club Smoke Room. I will tell you. The idea of the whole comping department waiting my pleasure is for the cajoling of the reader into impressions of importance. The real facts, told in secret, are these: My "copy" gets stuck on the copyholder of a machine like a huge typewriter. A man rattles the keys and pulls a few levers and treads on a few pedals, and in minutes a yard or so of "Galley-proof" is lying on my desk for corrections.

The fact is it is machine made. I wonder they trouble me to operate initially. The man on that other machine could turn out "Armchair Reflections" at the rate of a thousand a day, providing they were all alike, and there comes the rub.

I had the pleasure of a visit of inspection, graciously accorded by the Authorities, of that marvellously intact Zeppelin grassed in Essex. Readers will have gathered, from the pictures in our last issue, what a wonderful piece of construction it was, and how comparatively simple was the assembling of the various parts into a splendid whole, by reason of the thought that had been given to the standardisation of parts.

I have not yet heard of any German aeroplane captured "out there" which had been built on Zepp. construction lines, but I have no doubt at all that sooner or later such will be the case. Then, I suppose, when we have it clearly demonstrated to us that it can be done, and that the present method of slow and costly construction is not the right one, we shall get to work ourselves.

There are those in this office whose brains bulge with technical knowledge. They might tell me that it can't be done. I shall not enquire of them before writing these words, because they instantly feel for pencil, and go into long lines of equations to prove to their own satisfaction, if not mine, that it is against all established laws. These experts bother me with their figures. They work it all out on paper to my undoing. They will manufacture hydrogen in some mysterious fashion from zinc and acid before my very eyes, fill a silk envelope with it, and tell me that that quantity will lift exactly one pound. Yet when I get a pound weight, stamped officially correct by the Weights and Measures Office, and offer to bet them a shilling that it won't, they have not the courage of their convictions. They are equally shy if I offer to bet that it will. They are wary of cast-iron statements, these science fellows. They always want to introduce some such hedging as "Of course that is providing—" or "Allowing, of course that all things are equal." They tell me that an apple with the inside eaten out by wasps, and a leaden ball of the same dimensions will fall side by side when dropped from a great height "providing of course we ignore" something or other. I believe Sir Isaac Newton was satisfied to experiment with an apple. Possibly the leaden ball would have answered equally, provided he had ignored his scientific nose.

When I looked at that huge affair of aluminium in Essex, I could see that the building up of the mass was something that could be done quickly and with certainty. Things were standard. It was a question of girders braced with cross strappings. The parts could all be stamped out, and fitted together like "Mecanno" built toys.

I did not see any steel tubing that had had to be patiently rolled by hand to smaller diameter in certain parts of it. The blue-prints necessary to its construction must have been great in number, but simple in their reading. It appeared that the whole hull of her could be made by the thousand foot run, sawn off into lengths, and fitted together.

Engineers, bridge-builders and the like, are whales on building things of metal that shall fit. They will cheerfully build here in London, a bridge for Timbuctoo, send it out in sections, and be sure that when erected out there it shall fit to a millimetre. They have been through the school that teaches the value of that little sixteenth of an inch, which looks so small and means so much. Some day, when they realise what is wanted, one or more of them will astonish us by stamping out an entire aeroplane in parts that could be fitted up in less than no time with the aid of a shilling spanner.

Personally, I see no reason whatever why aeroplanes of given types could not be standardised and built of stamped parts. Neither do I see what there is against steel propellers, stamped out in halves and welded at their joining edges. Possibly there is some reason why it cannot be done, possibly there is not. I cannot put pencil to paper and prove that at one-thousand-two-hundred-point-five revs., the spelter would become demoralised and refuse to stick tight. Any way, the method of building as known to-day is a comparatively slow process, and expensive. They have to be constructed of woods dear and rare. These woods have to be grown during the progress of years. Possibly before the coming of the aeroplane we built our hen-coops and dog-kennels of some of it. We can't manufacture ash and walnut and the like; presently, with the building of machines by the ten-thousand, it will become the radium of the timber-world. We can manufacture metal. Failing one which we require on account of its lightness, we can substitute another altered in its shape to give strength.

Aeroplane builders will not always have to consider weight as they do to-day. The machine of the future will be a gigantic affair. We are in an age of progress. I might even yet live to see the day when I shall supply "Armchair Reflections" by pulling out certain stops, and pressing certain buttons and pedals. Perhaps with the final full stop a bell will ring and my emolument drop into a tin box. In most cases metal triumphs over wood. Look around you and notice.

* * *

"THE THEORY OF STRUCTURES."

WITH the enormous developments in aeroplane construction and growth of the aircraft industry, the time has long since gone when rule-of-thumb methods of design and construction were permissible, and, indeed, had to be for lack of anything better in the way of a sound foundation of combined theoretical knowledge and practical experience. Instead of the trial-and-error process so characteristic of the earlier days of flying, the science of aviation has now reached a stage where, although nothing like finality has been reached, we are at least in a position to predict with a fair amount of accuracy the performance of an aeroplane, provided it does not differ too radically from existing types. Instead of the anxious question of the old days "Will she fly?" the uncertainty has now been reduced to a question of whether "she" will come within a mile or so either way of the anticipated speed, or within a 100 ft./min. of the calculated climb. For this ability to estimate aerodynamic quantities beforehand we are largely indebted to the various aerodynamical laboratories, since their wind tunnel tests, coupled, of course, with the practical experience of the individual constructors and designers, provide the only data to build upon.

In the matter of carrying out mechanically the *construction* of the parts decided upon from aerodynamical considerations, great strides have undoubtedly been and are constantly being made. For machines of standard proportions practical experience has already settled pretty definitely the size, shape and material for the various component parts necessary for the requisite strength. As, however, the size of aeroplanes increases, new methods of construction will suggest themselves, and what has been found by experience to be good practice in the case of the smaller machine may quite conceivably be found inadequate when it comes to building machines that are out of the ordinary either as regards weight distribution or size, or both. It is in such a case, when there is no precedent, so to speak, in the aircraft industry itself, that advantage must be drawn from the experience gained through a number of years in other branches of engineering, and this experience applied to the special requirements of the aeroplane constructor. There can be little doubt that there are a number of students of aviation and even probably a few practical designers who, although well versed in the aerodynamical problems of flying, are somewhat at a loss when it comes to determine the various stresses set up in an aeroplane under the different conditions obtaining during even a straight forward flight. It is at this juncture that one has to look to other branches of engineering for information, and the branch that immediately comes to mind in this connection is naturally that of structural engineering. Of the books dealing with this subject we have not yet seen one that can approach the volume entitled *The Theory of Structures*, by Arthur Morley, M.Sc., M.I.Mech.E., Professor of Mechanical Engineering in University College, Nottingham. This book, which is looked upon as a classic in structural engineering circles, although not being written with a view to aeroplane structures, contains such a wealth of general information as to render it of the greatest value to aeroplane designers and students of aeronautics in general. From the elementary explanation of stresses and strains, dealt with in the simplest and most easily understood language, the author proceeds through easy stages to the more complicated problems dealing with a great variety of different structures. Both graphical and mathematical solutions are given, and the book is rendered all the more valuable by the number of numerical examples given. It is published by Longmans, Green and Co., of Paternoster Row, at 7*s*. 6*d*. net, which, in view of the character of the book, is exceedingly cheap. To assist our readers it can be obtained from "FLIGHT" office, post free for 8*s*.

AERIAL RUSSIA.

"THE British unfortunately have in the past known little and cared little about Russia. The Russian Empire has remained a mystery, and even now, when the two nations are bound by a most cordial friendship and are fighting a great war in loyal alliance, the large British public remains absolutely ignorant concerning the realities of the vast Empire of the Czar."

This statement taken from the introductory chapter of the book, "Aerial Russia," by Lieutenant-Colonel Roustam-Bek may be accepted as a general truth, and we are in wholehearted agreement with the author in his regret that this is so. Knowing that the author realises this shortcoming, and having read the title of his book, one opens it in the hope of gleaning from its pages some valuable knowledge of the historical development of Russian aviation in general, and the large aeroplane in particular. Unfortunately, having read through the 150 odd pages, one closes the book with the impression of having learned precious little about the work of Sikorsky and other pioneers of the large aeroplane, while obtaining only a rather vague picture of some of the personalities that have helped to make the aviation history of Russia. As a matter of fact, the short descriptions of Russian aeroplanes, and short paragraphs regarding their activities, published from time to time both in "FLIGHT" and other journals, meagre as they have been, tell one a good deal more about aerial Russia, and under a far less presumptuous title, than does this "Romance of the Giant Aeroplane."

When the author says that Russia is at present, from a purely scientific point of view, undoubtedly leading the whole world in the conquest of the air, we are inclined to think that his patriotism has got the better of his judgment. Again, the statement that up to the outbreak of war the only British subject who had ever flown in Russia was a Scotsman—Mr. Mackenzie-Kennedy—can hardly be accepted, since it is a well-known fact that the old-time Hendon pilot, Lewis F. W. Turner, now an officer in the R.F.C., flew on a Farman over the outskirts of St. Petersburg late in 1911. The machine, by the way, which he *was* to have flown was being built by Mr. Kennedy, but was not completed in time for testing before the Russian winter set in. Altogether one cannot refrain from regretting that the author of "Aerial Russia" has—if he was in possession of the needful data—missed an excellent opportunity of really enlightening the British public on the true value of Russian aeronautics.

Mr. John Lane is the publisher, the price is 2*s*. 6*d*. net, and about a score of illustrations accompany the text.

ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

F. H. B. (Birmingham).

A "lifting tail" is one which normally carries a certain amount of load, and which is therefore often cambered in order to make it more efficient. For instance, the tail planes of the old Farman biplanes were "lifting tail planes," and were, as a matter of fact, rather heavily cambered. By a non-lifting tail plane is meant one which does not, in the normal flying attitude, carry any portion of the load, but is merely "floating." This type of plane is usually, although not invariably, made of symmetrical section—*i.e.*, it is either a perfectly flat plane, built up of a framework of steel tubes, or it is constructed of spars and ribs after the fashion of the main planes, but symmetrical in section and convex on both sides. The object of the latter form of section is, of course, to provide a good "streamline" shape which will offer a minimum of resistance. During flight it constantly occurs that such a tail plane is momentarily loaded, the load being either upwards or downwards according to circumstances, and then, of course, the tail plane is no longer, strictly speaking, "non-lifting." It was mentioned that a non-lifting tail plane is not invariably symmetrical in section. Some designers favour a section in which the upper surface is convex, while the lower surface is perfectly flat. The reasons usually advanced for the employment of such a section are that, as the tail planes may—and, indeed, frequently do—work in the down draught from the main planes, a tail plane set parallel to the path of the machine, or, in other words, parallel to the propeller shaft, is virtually subject to a load acting in a downward direction. Now, an unsymmetrical tail plane like that referred to above is still giving a certain amount of lift at 0 angle of incidence, whereas the symmetrical section would, of course, give no lift when the incidence was zero. The plano-convex section therefore tends, owing to the slight lift at no angle of incidence, to counteract the effect of the down draught from the wings, and may therefore be said to be equivalent to a flat or streamline plane set at a slight angle to the propeller shaft. The tail plane of the B.E.2C, as is the case on the majority of modern machines, is of the non-lifting type.

G. B. (Teddington).

A "spirally unstable" machine is one in which the fin area is incorrectly proportioned. The vertical fin area of an aeroplane, as is well known, is composed of the vertical sides of the body, the inter-plane and chassis struts, the landing wheels (especially if these be of the "disc" variety), the propeller, the vertical tail fin. We do not include the rudder, as, to our way of thinking, a machine should be spirally stable even when its rudder is left to itself, *i.e.* trailing. Now, if the total side area of all these items has its centre of pressure in front of the centre of gravity of the machine, and the latter is subject to a relative side wind, such as may be caused by an incorrectly banked turn, it will be seen that a couple is set up, which tends to increase the sharpness of the turn. This, then, is the cause of a "spin." Theoretically there is no reason to suppose that a "pusher" is more liable to spin than is a tractor; the problem resolves itself into a proper distribution of side area. In practice, however, it will be found vastly more difficult to "balance up" a "pusher" than a tractor. The Caudron, by the way, is *not* a "pusher." The uphill gildes made by Mr. Raynham on the 80 h.p. Avro biplane were made by first diving the machine with the engine running so as to get up speed. The engine was then switched off and the momentum of the machine enabled it to glide a short distance uphill. This glide is not peculiar to this machine only, but may be, and has been, done on other types. The outer envelope of a Zeppelin airship is made of a stout fabric laced to the girders.

H. S. C. (Loughborough).

The chief reason for staggering the planes of a biplane is that by so doing a better view is obtained in a downward direction. There is also a small gain in efficiency when the planes are staggered, but as this only amounts to about 4 per cent., and staggering increases constructional difficulties, it would scarcely have been so extensively employed as is the case, but for the practical advantage mentioned above. The ratio between the area of the main planes and the area of the tail planes depends on so many factors, that no hard and fast rules can be laid down. In the first place, the travel of the centre of pressure varies considerably with different wing sections, one with a small travel of the centre of pressure obviously requiring a smaller tail area than does one in which the travel of the centre of pressure is great. Also the distance between the centre of gravity and the line of total reaction on the main planes for all the different flying attitudes of the machine will be a determining factor in the calculation of tail area, while the plan form and section of the tail itself will affect the area required, a tail plane of high aspect ratio being more efficient than one that is nearly square. Again, a machine in which the centre of thrust does not coincide with the centre of resistance will require a certain amount of tail area to counteract the couple thus set up. Generally speaking, for a given machine the farther the tail is from the main planes the smaller it may be kept, but lengthening the body means adding weight, and may mean adding resistance, so that in this case, as in so many others, a compromise has to be made.

R. W. (Hants).

We are not sure whether, under the new arrangements now in force, the grant is being made. He should apply to the Director-General of Military Aeronautics, Adastral House, London, E.C.

E. L. J. (Farnham).

Simply obtain from the Admiralty the necessary forms on which to apply for a commission, and, having filled them up, send them to the Director of Air Services, Admiralty, S.W.

E. O. (Sheffield).

There are vacancies in the Corps from time to time for skilled tradesmen, and your best course would be to inquire of the Officer in Charge of Recruiting, R.F.C. Depôt, Farnborough, as to whether there are any vacancies at the present time.

H. A. (Redcar).

1. The pay of a flying officer, R.F.C., when training is 7*s.* 6*d.* per day. 2. An R.N.A.S. Flight-Sub-Lieut. receives an additional 4*s.* a day when confirmed in his rank, making a total of 18*s.* 0*d.* per day. 3. He should apply to Adastral House for the necessary forms.

Ignorant (Gala).

A 2nd Air-Mechanic in the R.F.C. is only promoted to 1st Air-Mechanic in the usual way, and a "short training in London with a first-class certificate for driving and repairing a car" will not *entitle* you to promotion immediately.

F. H. M. (Barnet).

Lieut. R. A. Cammell was flying a Valkyrie monoplane when he was killed at Hendon, September 17th, 1911. The world's altitude record for a balloon is 10,800 metres, made by Suring and Benson from Berlin on June 31st, 1901. An airship cruises rather than flies—the latter term is usually accepted to apply to machines which are kept in the air either by their own volition or by the force of the wind. The average speed of Prevost in winning the Gordon-Bennett race of 1913 was 200 kilometers per hour.

V. G. A. (Teynham).

There is a Cadet Corps for the R.F.C., and you should apply to Adastral House for full particulars.

AIRISMS FROM THE FOUR WINDS

Good news for new Service members of the Royal Aero Club. Commencing with this week, it has been decided by the Committee that no entrance fee will be charged to Naval or Military officers joining the Club, so that they will have the opportunity of becoming full members for their annnual subscription only, which carries with it the advantages of the new Club House in Clifford Street, Bond Street, which, it is hoped, will be opened in about another month. In the meantime the address is at the old rooms in 166, Piccadilly.

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A free translation of the meaning of *Gott strafe England* by a non-German-speaking English Tommy prisoner in Konigsbruck Camp is to hand per Sergt.-Major Beaussier, of the French Army. Tommy was taken one day by a German N.C.O. before an inscription, " Gott strafe England," and was asked in English, " You know what that means ? " " No," said the English prisoner, " I can't read German." " It means," said the German N.C.O., " God punish England." " Because you can't punish her yourself, I suppose," was the prisoner of war's ready response.

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Drivers and conductors of tramcars in the metropolis are in future to be warned by the L.C.C. Highways Committee of possible hostile air raids, thanks to the action of the Commissioner of Police.

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It would appear as if the Commissioner is out for " notifying " generally, possible air raids upon a much more generous scale than has hitherto prevailed, as in the programme of " Elijah " at the Albert Hall last Saturday there was an announcement in the following terms :—

" Arrangements have been made that warning of a threatened air raid will be communicated to this hall by the military authorities.

" On receipt of any such warning the audience will be informed with a view to enable persons who may wish to proceed home to do so.

" The warning will be communicated, so far as possible, at least 20 minutes before an actual attack can take place. There will, therefore, be no cause for alarm or undue haste.

" Those who decide to leave are warned not to loiter about the streets, and if bombardment or gunfire commences before they reach home they should at once take cover.

" By order of the Commissioner of Police of the Metropolis."

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" The fourth element of war " is how wounded men in the recent fighting in France describe the indescribable new ally of Germany—mud.

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Probably so that neutrals may not detect the lies manufactured for home consumption by the German war disseminator of " victories " and other successes, when the capture or destruction of a few dozen " Tanks," more or less, is claimed, they are now disguised as " Panzerraftwagen." There's nothing of the Macfie sound about this.

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Evidently Count Zeppelin's airship company expects a huge influx of business, consequent upon the recent strafing of the four air pirates this side of the North Sea, as the report is to hand that the company's capital has been doubled, from £75,000 to £150,000. In the same ratio, with a few more visits, it should not be long before the capital should soar away beyond the million.

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Some " sky-pilot " ! The Surrey curate who has just taken a commission in the Royal Flying Corps.—*Passing Show.*

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Elsewhere in this issue it is recorded that the famous German pilot, Boelcke, has met his death, but whether at the hands of one of our pilots or in a bad landing following a collision in the air with another machine does not yet seem to be quite clear. Capt. Boelcke was not, as many people appear to think, one of the old hands in aviation, having, to the best of our belief, never done any flying until early in the war. He is credited with having brought down some 40 Allied aeroplanes, and was, like his *kamerad*, Immelmann, one of the few crack Fokker pilots. The secret of the success of his tactics appears to lie in the fact that he would swoop down on his adversary like a hawk, and that, if he failed to bring him down the first time, he would never return for a second attack, at least not at once. As his success was in a large measure due to the type of machine he was flying, a few personal items concerning, not the machine itself, as the Fokker has been fully described already in our columns, but the constructor of it, Mijnheer Fokker, may not be without interest.

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Anthony Herman Gerard Fokker was born at Kediri, on April 6th, 1890. He left India at a young age and went with his parents to Haarlem, where he spent his schooldays. As a youngster he was always interested in mechanics, and his great ambition from the earliest days was to become a pilot some day. It was not until 1910 that young Fokker, whose portrait we give through the courtesy of our Dutch contemporary, *Avia*, obtained his parents' permission to go to Germany in order to learn to fly. While at the Goedecker School at Gonzenheim, near Mainz, he learned his art, but was in no hurry to obtain his " ticket," which, as a matter of fact, he did not go for until 1911, when he obtained it in " good style," as the school reports generally have it, on a machine of his own construction.

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After leaving Gonzenheim, Fokker transferred his activities to Johannisthal, where he started a school and some very modest works. It can hardly be said that Fokker had an easy time of it at first, partly on account of the keen competition with much larger firms, and partly, possibly, because he was then still a foreigner in Germany. It may be remembered that several very good flights were made on the old type Fokker monoplanes (which were characterised by sloping back wings and no lateral control), among others that made by de Waal in 1913 from Johannisthal to Soesterberg in Holland. Demonstration flights were made at The Hague in the presence of military representatives, which resulted in Fokker going to Germany, where he became naturalised.

A. H. G. Fokker.

It was not, however, with his original monoplanes that Fokker came to the fore, but with what in all fairness can only be described as imitations of the French Morane, constructed, it is true, on different principles, but resembling it closely in general lines. Even before the outbreak of war the works at Johannisthal became too small, and others were started at Görries, near Schwerin. After a few months of war several Berlin bankers took the firm over and all the Dutch capital was bought out, Fokker himself becoming the director as well as one of the chief shareholders. Later he brought out a small monoplane which had a speed of some 200 kilometres per hour, and into this he fixed a machine gun that fired through the propeller. Fokker himself claims little credit for the machine, we believe, but he does claim to be the first to mount a machine gun in this fashion and to sight by means of the aeroplane controls. Hitherto the impression has been general that the famous French aviator, Garros, was the first to fire through the propeller. Be that as it may, for some time the Fokker monoplanes were the rage in German flying circles, and although they were, to our way of thinking, very much overrated, they certainly did excellent work in the hands of such crack pilots as Immelmann and Boelcke. The growth of the Fokker firm has continued rapidly, so that now, in addition to various works in Germany, there are branches in Buda Pest and Constantinople.

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THAT International Airship Corporation which has so many times been brought into existence in Berlin for the purpose of establishing a regular aerial post and passenger service between Berlin and Constantinople is still bobbing about in different forms. The latest phase of the little scheme puts the capital at a million and a quarter pounds sterling, and a special bait is being trailed to lure in subscriptions from the unwary to the wily promoter handling the finance. The present plan is to have the route extended from Berlin to Carlsbad, continuing to Vienna *via* Budweis, from there to Buda Pest, and thence on to Constantinople, over Sofia. Between these larger cities are to be numerous landing stations, the districts chosen for landings having to subscribe for shares.

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AT least this latter ruse is *not* a German brain-wave, as the idea has been quite a feature of motor and aviation circuit tours in France for years past. But we fancy the German public will not be too ready to help to have this air route in being for the Allies to annex presently when matters Continental smooth themselves out.

The Zepp. Raids, as seen in the United States.—"Gaining experience." (*By courtesy of the "Newark Evening News."*)

THE WATCHER IN THE NIGHT.

Up in the night,
Thick blackness around,
And never a sound
Save his engine's roar,
The Airman waits . . . waits . . . waits . . .
Patient as fifty Fates :
His hands are sore,
And his feet are frozen—
Who would have chosen
A task like this
But for the kiss
Of a loved one, lying asleep below,
While he waits aloft for the skulking foe ?
Or for England's sake
Does his valour wake,
Where the stars stare bright,
Up in the night ?

Up in the night.
Sudden, from distant earth,
Light springs to birth—
Light !
Its pencil pierces, and shifts . . . and stays . . .
And there, in the chill unwinking blaze,
Hovers, perturbed, the Form of Dread !
Swift overhead
The Airman dashes down to his prey :
Nearer he dives, and yet more near,
Till, poised like Vengeance over it sheer,
His moment's come—
His bolt strikes home !
He sees the monster sway,
Tremble, and strive to turn away ;
Another bolt he launches . . . and another !
Quick rush the flames along its side,
And, through the smoke and smother,
Come up to him, bursting with joy and pride,
Exulting in the battle,
The thin machine-gun's rattle,
And . . . thinner dreadful cries of agony !
It falls : a streaming flame all down the sky,
In hot air-eddies turning,
And burning, burning, burning !

At last it strikes the earth : a rending crash,
A thunderous roar, a blinding flash
That lights the sky for fifty miles . . .
So . . . *that's* all over,
That ends the fight . . .
His loved one shall sleep safe to-night !
No longer need the Airman hover . . .
He smiles . . .
His work is done
His battle's won !
Up in the night. —ARGENT. (*Passing Show.*)

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QUEEN MARY'S Zepp. £21 souvenir brooch, presented by Her Majesty to the British Red Cross, looks like bringing in quite a nice little sum to the Fund. Firstly, it was sold by auction at the Gift House of the Red Cross Society, Pall Mall, to the highest bidder. The purchaser was Mr. M. Mouchly, of Port Said, whose bid was £20. He intends to present the brooch to the Red Cross in Egypt, and hopes that it will fetch at least £500 there. It is made out of a portion of aluminium from the L. 21, which was wrecked at Cuffley, and bears the inscription "Zepp. L. 21, 1916. Sept. 3rd, Cuffley." By the time it gets round the world it should have a good trail to record.

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THERE must still be a lot of quaint predictions "undiscovered" in forgotten works relating to the navigation of the air. One by one they are being brought to light, and some are, by their insight into the future, of striking interest. The Rev. J. P. Bacon Phillips, of Crowhurst Rectory, Sussex, has just unearthed another of these curious prophecies. It is to be found in Ackermann's Repository for the year 1825, and reads as follows : "Balloons will next come into play. Then adieu to the greatness of Old England. We cannot expect to cut such capers in the air as we have done on the sea. We shall have too many and too powerful competitors on that element, which is alike open to all. *Delenda est Carthago.*" Had we read these words a few weeks ago, Mr. Phillips writes, they might have filled our minds with apprehension. Now, however, we are able to hold our own.

Col. Sir H. Capel L. Holden, Vice-Chairman of the Royal Aero Club, who is the Director of Mechanical Transport, has been elected the Upper Warden of the City Guild of Gunmakers. He entered the Royal Artillery in 1875, and for several years before he retired in 1912 was the Superintendent of the Royal Gun and Carriage Factories at Woolwich.

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Curious that about the same time "Flight" was obtainable by the public last week announcement was made of the Government's intention to bring about compulsory closing of shops, including particularly sweetstuff emporiums, large and small. It is to be hoped this new war-time measure will consequently release the necessary amount of sugar for our hospital war patients, for which we pleaded in Airisms last week, even if some of the poor jaded folk attending theatres at night have to go through the evening with a little less in the way of sweetmeat nourishment.

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal) of October,* 1906. "Flight" *was founded in* 1908.

The Airship "Ville de Paris."

M. Henry Deutsch's great airship "Ville de Paris" has been inflated, and experiments will shortly be commenced with it to see how it comports itself in the air. In the meantime it may be of interest to recapitulate the principal figures and novel characteristics of this great machine.

To begin with, the gas vessel is itself peculiar, and embodies a suggestion (by the late Col. Renard) of considerable interest for improving the controllability of the machine. The gas vessel, which is 62·50 metres in length, with a maximum diameter of 10·50 metres amidships, is torpedo-shaped, and it is at the rear end that the novel construction suggested by Col. Renard has been introduced. Instead of coming to a point, the rear cone tails off to a cylinder some 15 metres in length and 5 metres in diameter. Around this cylinder are eight other smaller cylinders with pointed ends; these are arranged in pairs, two deep, in such a way as to form vertical and horizontal fins to the rear part of the main gas vessel. These supplementary cylinders are filled with hydrogen, and their object is to increase the stability of the structure.

The hull, which is built on much the same lines as M. Santos Dumont's machines, and is 32 metres in length, is also suspended in a somewhat similar way from two lateral flaps in the gas-vessel by means of an interlacing triangular system of stays and ties, designed to give an exceptional degree of rigidity to the whole structure. A four-cylinder 70 h.p. Argus-Chenu motor, running at 900 r.p.m., is mounted nearly amidships in the hull, and operates a forward propeller or tractor by means of a propeller-shaft. There is a gear down of 1 to 5 between the motor and the propeller-shaft, so that the latter only revolves at 180 r.p.m., a rather low speed, it must be admitted. The propeller is also constructed on a principle suggested by Col. Renard, the blades being attached to the boss in such a way as to dispense with tie-rods.

M. Santos Dumont Wins the Archdeacon Cup in Free Flight.

To his great exploits of the past M. Santos Dumont has added the greatest *public* triumph that has yet fallen to the lot of any aeronaut. He has accomplished free flight for a distance of 60 metres through the air and at a height of approximately 2 metres above the ground, in a motor-driven aeroplane heavier than air, thus winning the Archdeacon Cup. After a run of about 75 metres the aeroplane soared into the air, rising 2 metres from the ground, for about 60 metres from the time it left the ground to the time the wheels again struck it.

AVIATION IN PARLIAMENT.

Aircraft Raids. A Reassuring Signal.

Commander Wedgwood, in the House of Commons on October 24th, asked the Secretary of State for War whether he will consider the possibility when danger from a Zeppelin raid in London has passed of reassuring invalids and parents of young families by sounding a hooter or in some other obvious way?

Mr. Lloyd George: I cannot say more than that this proposal is about to be considered by the Field-Marshal Commanding-in-Chief, Home Forces, in conjunction with the Home Office.

Mr. Billing: Might I ask whether, in view of the enormous amount of inconvenience that is caused by rumours on nights when Zeppelins are expected, information might not be withheld from responsible people asking for it from officials?

Mr. Lloyd George: I do not understand the hon. member's question.

Mr. Billing: Whether information regarding known raids might be withheld from any responsible person who asks a special constable or police official?

Officers' Flying Pay.

Major Hunt asked the Secretary of State for War why it is that if a wounded flying officer succeeds in bringing himself and his aeroplane back into the British lines, and thus saves himself from being taken prisoner and his machine from being captured by the enemy, he is deprived of flying pay after a short time in hospital, whilst a flying officer, whether wounded or not, coming down within the enemy lines or in a neutral country is given flying pay till the end of the war?

Mr. Forster: Flying pay, like other forms of special corps pay, is continued to officers who suffer the crowning misfortune of being imprisoned or interned. In other cases, special consideration is given to cases of injury due to flying, but the orders on this subject were found to have been overlooked in some cases, owing to the rapid growth of the corps. Action to correct this, including review of past errors, was taken in September last.

Mr. Billing: Would the hon. gentleman state whether or not the flying pay of an injured officer who succeeds in getting back wounded with his machine ceases when he comes out of hospital unfit or continues?

Mr. Forster: It continues as long as the officer is on sick leave on full pay. As my hon. friend is probably aware, the length of sick leave on full pay differs in differing circumstances. It rests largely, I think, with the commanding officer to settle how long sick leave on full pay should continue. I think there was some misunderstanding as to how far commanding officers' power was properly exercised. Attention has been called to it, and I hope the matter is in order now.

Mr. Billing: Would the hon. gentleman consider the fairness of allowing cases of officers who are so injured to receive their flying pay so long as they remain in the force for the duration of the war, and thus put them on the same basis as those taken prisoner?

Mr. Forster: I do not think we can make an exception in favour of flying officers.

Airships Over Wales.

Mr. Cory asked the First Lord of the Admiralty whether he is aware that a British airship's sudden appearance over parts of South Wales created a good deal of excitement that would have been avoided had any warning been given, even by a brief notice in the newspapers as had been the practice in London; and whether he will direct the officials responsible for these flights by British airships to give warning, whenever possible, of such proposed visits?

Dr. Macnamara: Airships were over South Wales during Monday, October 16th, but returned to their base in daylight. No reports have been received indicating that any alarm was caused.

Zeppelin Raids.

Major Newman, on October 25th, asked the President of the Board of Trade whether he is aware of the danger to which the inhabitants of Enfield and district are exposed in the case of a Zeppelin raid owing to the flashes from the electric tramways and also to the glare of steam reflecting from the fire-boxes of the engines on the Great Northern Railway; and whether he will take steps to remedy this state of affairs?

Mr. Forster: Special instructions are in force in regard to both the points mentioned, but it is not desirable that these should be made public. The hon. member may, however, rest assured that all possible is being done.

Personals.

Casualties.

Captain Leslie Stafford Charles, Worcestershire Regiment and R.F.C., reported missing on July 30th and since reported killed on that day, aged 21, was the second son of Mr. and Mrs. R. Stafford Charles, of Broomfield, Stanmore. He was educated at Stanmore Park (the Rev. Vernon Royle), where he took a Mathematical Scholarship for Harrow. At Harrow he became a member of the O.T.C. and the Philatelic Club, and head of his house. He left there in July, 1914, and in the following month received a commission in the Worcestershire Regiment. In May, 1915, he was sent to Gallipoli and was present at the battles of June 4th–9th. He was subsequently invalided home, and was gazetted Captain on November 20th, 1915. Early this year he joined the Royal Flying Corps and took his pilot's certificate last April. He left for active service on July 5th, and lost his life in a combat in the air over the German lines.

Second Lieutenant A. Cropper, Wiltshire Regiment and R.F.C., who has died of wounds, was the younger son of the Rev. C. H. E. Cropper, Vicar of Holy Trinity, Clifton, and was 19 years of age.

Second Lieutenant A. B. Drewery, R.F.C., reported killed, was the only son of Mrs. Drewery, 2, Fernley Road, Sparkhill, Birmingham. Educated at St. John's School, Sparkhill, he gained a Foundation Scholarship at Camp Hill Grammar School, and also the Yardley Governors' Exhibition. He was the winner of many certificates and honours at the Municipal Technical School, and after serving an apprenticeship with Kynoch, Ltd., was employed at the works of Willans and Robinson, Rugby, and the Wolseley Motor Co., Birmingham. In 1913 he was elected graduate of the Institution of Automobile Engineers. When war broke out he had been for nearly two years in partnership in a motor agency at Scarborough, but immediately enlisted in the Army Service Corps, Mechanical Transport. He was 10 months in France with heavy lorries, and, being made Sergeant, was nine months with field ambulances. Accepting his discharge in March, 1916, he applied for a commission in the Naval Air Service, but not being successful he went to a flying school at his own expense, and obtained his certificate in six weeks, after which he got his commission in the Royal Flying Corps, and on July 1st went to the Front.

Second Lieutenant Ernest Edward Glorney, R.F.C., killed on October 25th, was born in 1887. He was the youngest son of the late George Glorney and Mrs. Glorney, of Dublin, and was educated in Dublin. A mining engineer, he graduated from Columbia University, New York, and the Royal School of Mines, South Kensington, and was a member of the Institute of Mines and Metallurgy. He followed his profession in North and South America, South Africa, and Nigeria. At the outbreak of war he held the position of mining engineer and manager of the Renang Tin Mining Company, Siam, which position he gave up in order to return to England and join the Royal Flying Corps. He received his commission early this year.

Second Lieutenant William Henry Irvine, R.F.C., killed while flying in England on October 25th, was the only son of Mr. and Mrs. H. O. Irvine, of Southerndown, Bridgend, Glamorgan. He was educated at the Old Hall, Wellington, Shropshire, and at Malvern. After leaving school in December last he matriculated at London University, after which he was employed at a munition factory. He enlisted in the Royal Fusiliers in May, and got his commission in the Royal Flying Corps in July, and received his "wings" on September 28th.

Lieutenant John Anderson Mann, Cameronians, attached R.F.C., previously reported missing on August 9th, was shot down on that date with his pilot when on patrol duty. He was 21 years of age, and was educated at Ardvreck, Charterhouse, and Trinity College, Cambridge. He was the best rifle shot of his year in the public schools. On the outbreak of war he was gazetted to the Scottish Rifles, and joined the Royal Flying Corps last March. Shortly afterwards he and his pilot distinguished themselves by disposing of eight German aeroplanes in seven days. They were each awarded the Military Cross for consistent gallantry and skill. Lieutenant Mann was the eldest son of Mr. John Mann, chartered accountant, of Glasgow and London.

Second Lieutenant Francis George Wake Marchant, R. West Kent Regiment and R.F.C., killed on October 22nd, aged 19, was the only son of Mr. and Mrs. Frank Marchant, of Woodside, Hayes Common, Kent. He was educated at Eton and Sandhurst, and received his commission in the R. West Kent Regiment on October 19th, 1915, but joined the Royal Flying Corps the same week. He went overseas on March 30th last.

Lieutenant Thomas Waldegrave Nops, R.F.C., reported killed in action, was the fourth son of Mr. and Mrs. Edwin Nops, of Brentwood Lodge, Surbiton Hill, and was 24 years of age. Educated at King's College, he entered the service of Messrs. Higginson and Co., City bankers. Joining the Public Schools Corps at the outbreak of the war, he was gazetted to the East Surrey Regiment, and afterwards transferred to the Royal Flying Corps. In a letter the commanding officer states that Lieutenant Nops was in the air in a kite balloon with an observation officer, when the balloon was suddenly attacked by an enemy aeroplane. Instead of hurrying to the ground in his parachute Lieutenant Nops opened fire on the aeroplane with his rifle. In the excitement of the fight he did not appear to notice that the balloon had been set on fire on top, until the flames spread and the balloon began to fall to the ground. He showed the observation officer how to put the final attachment to his parachute, and told his companion to jump. The officer did so, and reached the ground safely. He expected Lieutenant Nops would follow, but it is surmised he had no time to escape by means of his own parachute. He fell with the balloon and was killed instantaneously.

Second Lieutenant Aubrey F. A. Patterson, R.F.C., unofficially reported as having died of wounds as a prisoner of war in Germany, was born in 1895. He was the youngest son of Mr. and Mrs. W. R. Patterson, of 40, Cleveland Square, Hyde Park, and was educated at Berkhampstead and Eastbourne College. He distinguished himself as an athlete and took the swimming championship at Eastbourne when he was 16. Within a few days of the outbreak of war he enlisted in the H.A.C. and went out to France at the end of 1914. He was invalided to England in 1915, and received a commission in the West Yorkshire Regiment, being subsequently attached to the R.F.C. He went back to the Front this year and became actively engaged in bombing operations, in which he did "excellent work." He was brought down on September 17th by a German squadron, and died of his wounds at Osnabruck.

Second Lieutenant George Keith Welsford, R.F.C., reported killed, was the eldest son of Mr. J. H. Welsford and Mrs. Welsford, of Carlton Gardens and Mansfield House, Iver Heath, Bucks, and was 25 years of age. He was educated at Bilton Grange and at Harrow. Lieutenant Welsford was a keen member of the Harrow O.T.C., and was the school champion light-weight boxer and a school swimmer. At the outbreak of war he was sugar-planting in Demerara. He returned home immediately and enlisted in the Royal Engineers as a despatch rider. Lieutenant Welsford went to the Front in June, 1915. He was gazetted Second Lieutenant in the Royal Flying Corps in June, 1916, and was posted as a fully qualified Observer a few weeks ago.

Wounded.

Flight-Lieutenant O. D. Filley, R.F.C., officially reported wounded, is an American, who was president of the Harvard University Boat Club and stroke of the Harvard eight which visited England in 1906 to row a match on the tideway against

D. C. R. Stuart's Cambridge crew. Lieutenant Filley came over to offer his services early in the war, and has since been awarded the Military Cross for daring attacks on German aeroplanes.

Missing.

It is reported from Liverpool that Lieutenant Cecil Roberts, of the R.F.C., is reported missing after being in action. According to his squadron officer, Lieutenant Roberts, who is a son of a well-known Liverpool merchant, went out with several other machines on the 17th inst., and after much hard fighting had the misfortune to be brought down on the other side of the line. Lieutenant Roberts was well known in swimming circles. He won the Mersey Defences swimming championship in June, and also carried off the Lord Mayor's gold medal in the Officers' race.

Married and to be Married.

The marriage arranged between Philip Bentinck Boyd, Second Lieutenant, Gordon Highlanders, attached R.F.C., elder son of Mr. and Mrs. Gamble Boyd, Toronto, Canada, and Dorothea, youngest daughter of Mr. and Mrs. Ridler Davies, Montreal, Canada, took place at St. Paul's, Knightsbridge, last Saturday.

An engagement is announced between Flight-Lieutenant Francis Donald Holden Bremner, R.N., elder son of Captain Donald Bremner, late R.A., Assistant Commissioner, City of London Police, and Mrs. Bremner, and Vivyen Groser Hurd, daughter of Mr. and Mrs. Archibald Hurd, of Hampstead, and Hope Point, St. Margaret's Bay, Kent.

A marriage has been arranged, and will shortly take place, between Flight-Commander J. H. Lidderdale, R.N., fourth son of Dr. and Mrs. James Lidderdale, of Cleevelands, Prestbury, Cheltenham, and Maud, youngest daughter of Mr. and Mrs. J. Hanson Walker, 2, Queen's Elm Square, Chelsea.

The engagement is announced between Captain C. E. H. Medhurst, R. Inniskilling Fusiliers and R.F.C., youngest son of the late Rev. C. E. Medhurst and Mrs. Medhurst, of Collingham Vicarage, Leeds, and Christobell Elizabeth, youngest daughter of the Rev. and Mrs. T. E. B. Guy, Fulford Vicarage, York.

The marriage arranged between Captain Mosley-Leigh, R.F.C., and Miss Olive Stirling-Cookson will take place on November 7th, at All Saints', Ennismore Gardens, S.W.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *Admiralty, October 26th.*

"On the 23rd and 24th inst. attacks in force by naval aeroplanes were carried out on the railway stations at Buk and Drama (both on the railway from Constantinople to Salonica). Considerable damage was done to the rolling-stock.

"One of our machines failed to return from the attack.

General Headquarters, October 26th, 9.30 p.m.

"In spite of the unfavourable weather, our aeroplanes yesterday co-operated successfully with our artillery, and bombed many enemy billets and depôts. Three of our machines have not returned."

General Headquarters, October 27th, 8.58 p.m.

"Yesterday enemy aeroplanes showed unusual activity; an aerial engagement took place between large numbers of machines on both sides. It is reported that five machines fell during the fight, two of which were our own.

"On another occasion one of our pilots, encountering a formation of 10 hostile machines, attacked them single-handed, and dispersed them far behind their own lines."

General Headquarters, October 29th, 9.55 p.m.

"Yesterday, in spite of a strong adverse wind, much useful reconnaissance work was done by our aeroplanes. One of our machines is missing."

General Headquarters, October 30th, 9.30 p.m.

"Owing to the inclement weather there was little aerial activity yesterday. One enemy machine was seen to fall in flames."

War Office, October 30th.

"*Balkans.*—North of Lake Doiran hostile aeroplanes were brought down.

"*Struma Front.*—West of Demir Hissar an enemy transport park was bombed by our aeroplanes with excellent results."

French. *Paris, October 24th.*

"On the Somme front one of our aeroplanes attacked with a machine gun the enemy's trenches in the St. Pierre Vaast Wood. On the Verdun front yesterday, in spite of a thick mist, our aircraft displayed activity and fought some 20 engagements. Three enemy machines were brought down, one to the north of Azannes, another near Ornes, while the third was seen to fall with a broken wing north of Romagne. Following upon an engagement fought by one of our air squadrons with an enemy group in the region of Verdun, one of our pilots came down to within a hundred metres from the ground in order to set fire to a shed, and to open with his machine gun on a motor car. In Lorraine two German machines were forced to come down damaged. In Alsace one of our pilots brought down an Aviatik, which fell near Cerny. Yesterday our bombarding planes dropped three heavy calibre bombs on the railway station of Spincourt, and about 20 on enemy bivouacs at Azannes."

Paris, October 25th.

"Between 11 in the morning and 1 in the afternoon of October 23rd 11 British bombardment aeroplanes, accompanied by five protecting aeroplanes, bombarded the blast furnaces of Hagondange, on which they threw over a ton of projectiles.

"As the result of this raid several fires were caused. The aviators were able to observe that the bombardment carried out the previous night at the same place by the French aeroplanes had had good results, much damage having apparently been done."

Paris, October 26th.

"A German aeroplane was brought down in the region of Vauquois, in the neighbourhood of our lines, by the fire of our motor guns. One of our pilots attacked from a height of 300 ft. an artillery column on the road between Conflans and Etain, and threw the drivers into disorder. The latter fled, abandoning their teams."

Paris, October 27th.

"Yesterday enemy aeroplanes showed unusual activity. An aerial engagement took place between large numbers of machines on both sides. It is reported that five machines fell during the fight, two of which were our own.

"On another occasion one of our pilots, encountering a formation of 10 hostile machines, attacked them single-handed, and dispersed them far behind their own lines.

"During the night of the 26th–27th our bombarding aeroplanes dropped 40 bombs on the station of Grandre, eight on that of Challerange, 30 on the enemy bivouacs at Fretoy-le-Châteaux and Avricourt (north of Lassigny), where two fires were observed.

"During the same night 10 of our aeroplanes dropped 240 bombs of 120 mm. on the station of Conflans, and 30 of the same calibre on the station of Courcelles. The objectives were hit by numerous projectiles. Another of our machines dropped six bombs on the railway at Pagny-sur-Moselle."

Paris, October 30th.

"*Salonica.*—A German aeroplane was brought down in our lines."

Italian. *Rome, October 24th.*

"Taking advantage of the fine weather aircraft were active. An enemy aeroplane was shot down by our aviators, and fell in flames near Biglia, south-east of Gorizia. Austrian hydroplanes dropped bombs over the Caorle Lagoon, at the mouth of the Tagliamento, without doing any damage. A French aviator belonging to one of our squadrons succeeded in destroying one of the enemy machines."

Roumanian. *Bucharest, October 27th.*

"At Hugcis an enemy aeroplane was brought down by our artillery."

German. *Berlin, October 21st.*

"Our battle air squadrons supported our observation airmen in numerous air attacks. Twelve enemy aeroplanes were shot down, four of them descending behind our lines. A night air raid on railway stations and ammunition depôts behind the enemy's front had good success. Conflagrations and explosions were observed.

"*Balkans.*—German aerial squadrons successfully participated in the fighting (in the Dobrudja) from the air."

Berlin, October 23rd.

"Twenty-two enemy aviators were shot down by aerial attacks and anti-aircraft fire. Eleven aeroplanes are lying behind our lines. Capt. Boelcke conquered his thirty-seventh and thirty-eighth foes, and Lieut. Frankl his fourteenth enemy.

"Enemy aviators dropped bombs on Metz and villages in Lorraine. No military damage has been caused, but five civilians died and seven were taken ill through inhaling the poisonous gases emitted by the bombs.

"Yesterday enemy seaplanes attacked our East Frisian Islands. The attack was without result, and no damage was caused.

"*Balkans.*—A naval aeroplane landed far behind the retreating enemy, destroyed two aeroplanes on the ground and safely returned."

Berlin, October 26th.

"*Balkans.*—During the night of October 25th our airships dropped bombs on the railway near Fetesti (west of Czernavoda), with satisfactory results."

Bulgarian. *Sofia, October 18th.*

"Enemy aeroplanes unsuccessfully dropped bombs on Prilep."

Sofia, October 24th.

"A German seaplane descended behind the enemy's front on the aerodrome near the village of Karaksum, and destroyed two enemy aeroplanes, after having killed the soldiers on guard. The seaplane returned safely."

BRITISH AIR WORK.

The following incidents, extracted from recent reports of the Royal Flying Corps in France, were issued by the Air Board on October 27th :—

"September 15th.—Artillery co-operation. On one Army front 70 hostile batteries were engaged and 159 active batteries were located, 29 of which were silenced ; 13 direct hits were observed.

"In a successful bombing raid carried out on Bapaume Station 38 bombs were dropped from heights varying from 200 to 800 ft. One train, several trucks and the station buildings were repeatedly hit, and the railway line was badly damaged. At Velu Station three trains were hit, several coaches derailed and a large store by the side of the line set on fire. Six bombs were also dropped on a neighbouring aerodrome. During the raid on Bapaume Station the escort protecting the bombers accounted for four German machines, which were seem to fall to earth.

"On the same day another bombing party attacked trains in the vicinity of Cambrai ; one bomb, dropping from a height of 500 ft., exploded and blew up an ammunition train, a previous bomb having hit the engine. Another bomb was dropped in the midst of a mass of troops, who got out of the train. A truck of another train was also hit. In the course of this raid some of our pilots attacked transport which was alongside the train with machine-gun fire. Damage was also done to trains at several other stations, and troops and transport on the road leading to Le Transloy were attacked with success.

"Two of our pilots, while on an offensive patrol, encountered 17 hostile aeroplanes at varying heights. They dived into the middle of the hostile formation and attacked. One pilot got to very close quarters with a hostile machine, which burst into flames and was seen to plunge to earth. He then attacked a second machine, which was driven down and fell in a field. A third machine went down vertically, and was seen to crash.

"Second Lieut. 'A,' whilst on patrol, observing infantry on a road, dived down to 200 ft., attacked with his machine gun, firing about 100 rounds and causing great panic and many casualties. He was subjected to very heavy rifle fire. On many other occasions German infantry were engaged with machine gun fire from aeroplanes, and one battery was temporarily silenced.

"September 21st.—Lieut. 'B,' having dispersed a formation of six Rolands, got underneath the nearest machine and emptied a drum of ammunition into it. The enemy went down and landed apparently under control. Lieut. 'B' then attacked a second machine from underneath and fired two drums into the pilot's seat. The hostile machine was seen to plunge to earth. Later in the evening Lieut. 'B' destroyed another machine.

"Second Lieut. 'C' attacked and brought down a hostile kite balloon. At 3,000 ft., when over Comines, he dived on the balloon which was then rapidly descending. He opened fire at 400 yards and finished his drum as he passed about 20 ft. over the balloon, which had by that time caught fire.

"September 22nd.—A bombing raid was carried out on Somain Station. An ammunition train was blown up, and the rolling-stock, permanent way, station and sheds were considerably damaged.

"September 23rd.—Artillery co-operation. Artillery, in co-operation with aircraft, obtained four direct hits on gun-pits and two on an anti-aircraft battery, both of which caused explosions. Two hits were obtained by siege artillery on a hostile battery. Trenches were damaged and some lorries west of Vimy were hit. Second Lieut. 'D' and Corpl. 'E' attacked a hostile machine near Sailly Saillisel. The German was driven down, and appeared to be out of control. Later, when near Morval, they attacked two hostile machines, one of which succeeded in getting in position in rear of our machine. Lieut. 'D' stalled the machines, and the observer stood up to use the rear gun, but he had barely pulled the gun into position when he was hit in the head and killed. The gun fell down, as the stand had not been clipped into position, and struck the pilot on the head. The pilot remembers nothing distinctly until he recovered consciousness on the way to a French Army Headquarters.

"Captain 'F' engaged two hostile machines over Warlencourt. He emptied a drum into one of them at a range of 5 yards. The German machine fell to earth.

"In a bombing raid 132 bombs were dropped on Fresnoy, Lens and Lille Stations, and considerable damage was done. Douai Railway Station was also attacked. A fire and explosion were caused at Roisel Station. Bapaume Station was also attacked and considerably damaged.

"Three further bombing raids were carried out by night.

"At about 6 p.m. Lieut. 'G' engaged four two-seater Rolands. Approaching from behind he scattered his opponents by firing one drum at them. He then got underneath the nearest machine, into which he fired 90 rounds. The machine caught fire, and was seen to plunge to earth.

"Lieut. 'H' while on an offensive patrol attacked a Fokker. The German machine was destroyed.

"Fifty-two bombs were dropped on Seclin Railway Station, setting fire to the main station building and hitting the railway bridge.

"September 25th.—The following scheme, which was planned to intercept traffic on the Douai–Lille main line, was carried out on September 25th. The railway station at Libercourt, sidings and rolling-stock were to be bombed and an attempt made to attack trains going south in the hope that they might be carrying troops or ammunition towards the Somme battlefield. Patrols, each of three aeroplanes, were first sent to attack neighbouring enemy aerodromes to prevent German aeroplanes from going up to interfere ; smoke bombs were dropped at intervals to keep the aerodromes enveloped in smoke, and from time to time a high-explosive bomb to show that our machines were still there. During this period two of our machines were to descend and attack the trains. The first train to appear was seen leaving Libercourt at about 1.40 p.m., and our machines dived down to attack it. While descending a second train was seen coming up on a branch line towards Ostricourt, where it joins the main line, and one of our machines diverted on to it. The first train was attacked from a height of about 800 ft. near Ostricourt ; six bombs were dropped. The engine was hit, became derailed and two or three of the front coaches partly telescoped. German soldiers immediately began to alight, were fired on and ran towards Ostricourt village and woods. There were so many men that the pilots said it would have been hard to miss them, and a large number were either killed or wounded. Meanwhile the second train came to a standstill near the junction as the wrecked train on the main line was blocking its way. The other machine attacked it with six bombs, two of which hit the train and one the engine. Troops also here began to descend and were fired on. They fled towards the neighbouring village. Altogether between 600 and 700 rounds were fired by the two aeroplanes, and many German soldiers were hit. Neither of our machines were fired on. As soon as the attack on the trains began the main raiding party, composed of seven aeroplanes, and an escort attacked Libercourt Station at about 2 p.m., where 14 heavy and 34 smaller bombs were dropped. Station buildings, sidings and rolling-stock were hit, some carriages were wrecked, and one coach was afterwards observed to be lying crossways over the line.

"The patrol over Brovin Aerodrome destroyed a hangar in the course of its work, and that over a neighbouring village caused a fire, which spread all over the northern part of it.

"This is believed to have been casued by a petrol store being hit, as the fire was still burning at 7 p.m. that evening. One hostile aeroplane came on the scene during the proceedings, but this was easily driven off.

"September 26th.—A contact patrol machine flew over Gird trench at between 300 and 400 ft. during the morning. The Germans in the trench held up their hands and waved white handkerchiefs. This information was transmitted to the ground station, and the Germans shortly afterwards surrendered to our troops.

"Hostile kite balloons were attacked at 11 a.m.; two were brought down in flames."

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Any Machinery Standing Idle?

Manufacturers possessing idle resources and desiring to be placed in touch with Government Contracting Departments are invited to communicate with the Central Clearing House, Ministry of Munitions, 8–9, Northumberland Street, W., with the object of utilising any machinery which they have unemployed. To this end the Minister of Munitions has established a central clearing house organisation in the Ministry for the purpose of tracing and registering all such machinery which is idle or about to become idle. The organisation will endeavour:—(*a*) To ensure that contracts placed by the Ministry are directed towards any unoccupied manufacturing capacity which might exist in the country; (*b*) To place engineering contractors who have suitable facilities for particular supplies in touch with the Ministry and with other Government departments requiring these supplies, and to help contractors who are able to undertake additional or more suitable work now or at a future date to maintain continuous employment of their machinery and labour.

A Colonial ex-Premier on Air Power.

At the meeting of the Pilgrims addressed by Mr. W. F. Massey, the Prime Minister of New Zealand, on October 26th, Sir Joseph Ward urged that from the war the lesson should be learned that in the years to come an air fleet of a magnitude equal to that of the British Navy on the seas would be necessary if we were to hold our own and maintain the solidarity of the British Empire. As in the past a naval programme of two keels to every keel laid by our rivals had been necessary, so must the programme of construction of the British air fleet surpass the programme of other Powers. It must be recognised that war in the air would be a factor of vast importance.

The Death of Captain Boelcke.

Although there is some doubt at present as to how he came by his end, it is now admitted from Berlin that Capt. Boelcke was killed on October 28th during an air fight. The Berlin telegram says that his machine collided with another, and he was killed in landing in the German lines, but a Cologne message states that he was shot down by a British pilot east of Cambrai. It is claimed that on the previous day he had shot down his fortieth enemy machine.

It will be recalled that it was reported that he had been shot down and killed by the French pilot Adjutant Ribiere on June 18th, the day that Lieut. Immelmann, was felled by Lieut. McCubbin, R.F.C., but the report was quickly contradicted from Berlin. Until the death of Immelmann his name and Boelcke were almost always linked together as the outstanding exponents of the Fokker monoplane. Boelcke was 25 years of age, and took up flying in the spring of 1914.

Another Prominent German Flyer Killed.

According to the correspondent of the *Lokalanzeiger* on the Western front, German military aviation has sustained another heavy loss in the death of Capt. Schmidt, one of their best pilots. He is said to have been shot while over the Allied lines, and though he got back to the German lines he succumbed to his wounds soon afterwards.

The Mystery of Commander Mathy.

Despite the persistence with which German Press agents tried to make out that the Commander of the airship "L. 31" brought down at Potters' Bar was Capt. Schreib Muller, it is apparently now admitted that Capt.-Lieut. Heinrich Mathy was the officer. At any rate, *Die Woche* prints his portrait and describes him as the "commander of the airship destroyed on the aerial attack on London October 1st-2nd."

The paper also publishes a photograph of "Ober-Lieutenant zu S. Werner Peterson, who met a hero's death in the aerial attack on London, September 23rd-24th." Presumably he was on the airship brought down in flames in Essex.

Zeppelins Working with Submarines.

In connection with the ruthless submarine campaign against Scandinavian shipping, the Germans are using a great number of Zeppelins for patrolling the Norwegian coasts, says the Bergen correspondent of the *Politiken*. The crew of one of the torpedoed Norwegian ships report that a Zeppelin, having sighted the ship, signalled with a large flag, whereupon a German submarine came up and sank the steamer. A number of other steamers are being pursued by the airships.

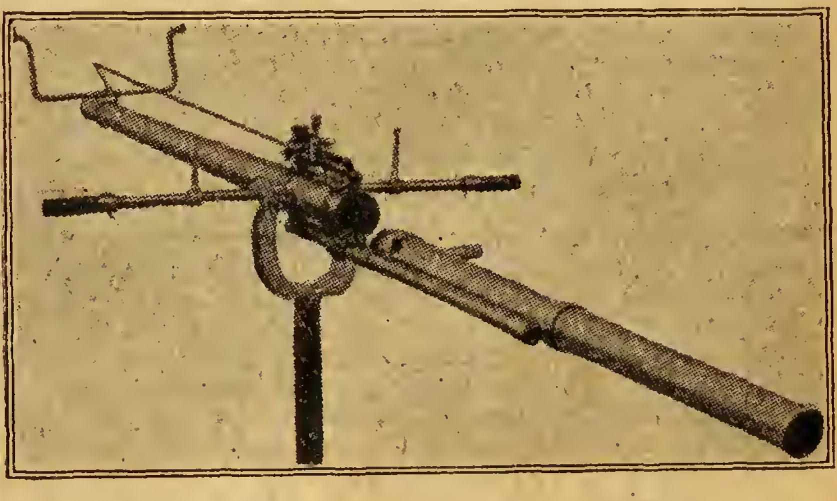
Holland and Zeppelins.

Both the *Telegraaf* and the *Nieuws van den Dag* are urging the Dutch Government to take stronger measures against the repetition of Zeppelin incidents over Holland. The *Telegraaf* characterises the recent trip, when a bomb was dropped, as a hostile act against which protests are useless, while the *Nieuws van den Dag* describes it as an intentional violation of Dutch territory.

The former paper demands a larger number of anti-aircraft installations, and calls for airmen to be stationed near spots which have special importance for the Germans, in order that when a Zeppelin appears over Holland strong military measures may teach the Germans to refrain from such undesirable visits.

Count Zeppelin at it Again.

Having recovered from his recent illness, Count Zeppelin has been paying a visit to his works at Friedrichshafen. By way of encouraging the workmen, he told them that the airships they had constructed had recently spread destruction and terror in the world's largest fortified capital.



The Davis non-recoil gun, which has been developed in America for use on aeroplanes. It is seen with the breach open for loading.

SIDE-WINDS.

THAT he might have been able to spare a couple more hours to inspect the extensive works of the Blackburn Aeroplane and Motor Co., Ltd., was the only regret of Field-Marshal Lord French at the conclusion of his visit last week. Under the guidance of Mr. Blackburn, the Managing Director, and Mr. Stuart Hirst, Chairman of the Company, Lord French went through the whole of the shops, and saw the complete process of building an aeroplane from drawing board to the final inspection. He expressed his appreciation of the completeness of the company's organisation, and was greatly interested in the numberless labour-saving devices and arrangements which have done so much to expedite the building of aircraft. One department which proved specially attractive was that given over to propeller building, where air screws were seen in the various stages of manufacture, while a fascinating display of finished propellers had been arranged in an annexe. The visitors—for the Field-Marshal was accompanied by Brig.-Gen. H. C. Lowther, Lieut.-Col. A. Fitzgerald Watt, Col. Gordon, the Lord Mayor of Leeds, the Chief Constable and many others—were also interested in the work of the company as regards the welfare of their employees, and the canteen buildings were not forgotten in the tour. As a souvenir of his visit, Lord French was presented by Mr. Hirst with an album, bound in red morocco and suitably inscribed, containing photographs of the interior and exterior of many of the office and works buildings.

* * *

MESSRS. J. W. CARR and Co., LTD., the machinery, tool and metal dealers of 35, Queen Victoria Street, E.C., advise us that Mr. J. Wilson, of their Machine Tool Dept., is no longer in their employ.

* * *

MR. ALEXANDER JOHNSTON, the General Manager of the North British Rubber Co., Ltd., Castle Mills, Edinburgh, has just been made a Justice of the Peace for the County of the City of Edinburgh. Congratulations!

* * *

PRACTICAL and scientific opinions differ as to the most economical methods of utilising labour, whether it shall be seven, six days, or otherwise continuous work. On balance it is beginning to be conceded that all work and no rest tends very materially to defeat its own end so far as output is concerned. The tendency is therefore to give relaxation with discretion and gather in as a result the greater advantage from labour untired. Nevertheless, no aid should be left untried which may help to the greatest efficiency, and from personal experience we can vouch for the very remarkable recuperative effects of Horlick's Malted Milk, which is a combination of pure, rich, full-cream milk to which is added the nutritive extracts of malted barley and wheat, and, being in powder form, it keeps indefinitely anywhere, and is instantly ready for use by stirring briskly in hot or cold water. This preparation is produced under ideal conditions, and its absolute purity can always be depended on, as it is manufactured by the latest scientific methods in a district of England noted for its milk and cereal supplies. Whereas many persons find a difficulty in properly assimilating and digesting ordinary milk, which is largely used to counteract the ill-effects from which many workers in munition works suffer at the present time, Horlick's Malted Milk contains far more nutriment than ordinary milk, and can be taken without difficulty by even those of the weakest digestion, and is therefore extremely valuable to all who are feeling the stress and strain of extra work, especially those who are doing this under unfavourable conditions. Horlick's Malted Milk is also obtainable in the form of delicious tablets to be dissolved in the mouth as required, very useful when it is not convenient to prepare a drink, and in this form it has been supplied extensively to H.M. Forces both direct and through the War Office and Admiralty.

Those interested in keeping munition workers, both male and female, in the best possible condition will do well to communicate with Horlick's Malted Milk Co., Slough, Bucks. by whom fullest particulars will be supplied.

* * *

CHAS. BOSS AND Co. (LIVERPOOL), LTD., have now landing about 50 stds. prime silver spruce ex "Manchester Exchange" and "Manchester Merchant." They will be glad to answer any inquiries at 634, Royal Liver Building, Liverpool.

AFTER a drive in cars provided by the Motor Squadron of the London Volunteer Rifles, Mr. Albert E. Cole and others, a large party of wounded soldiers were entertained to tea and a musical programme at the Bishopsgate Institute on October 21st. The event was under the auspices of the Coachbuilding and Motor Trade Fund for Entertaining Wounded Soldiers. and was as successful as the outing to East Molesey in September.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

CIRCUITS and landing practice with instructor last week: Messrs. Cockell, Edwards, Green, Hitchcock, Keizer, Meering, Munro, Norris, Ranson, Robertson, Sutherland, Travers, Whiteman, Woods and Zambournis. Straights alone: Mr. Culver. Circuits alone: Lieut. Rogers and Mr. Steeves.

Brevet taken by Mr. Saunders.

Instructors: Messrs. Manton, Winter, Pashley, Hale and Biard.

Hall School, Hendon.

PUPILS under instruction last week:—With Cecil M. Hill: Messrs. Dutton, Lieut. Malden, Shepherd, Hewett, Packman and Hill. With Fred J. Glegg: Messrs. Blake, Maude, Yuill, Heathcote and Foster. With Stanley G. Cownie: Messrs. Mayer, Heathcote, Course, Maude, Foster, Gamble and Blake. With Ernest Charles Orton: Messrs. Rodgers, Gamble, Hewett, Todd and Jackes.

Royal Aero Club certificate taken by Mr. Dutton on 70 h.p. Hall tractor biplane.

PUBLICATIONS RECEIVED.

An Outline of Theosophy. By C. W. Leadbeater. London: The Theosophical Publishing Society.

Theory of Structures. By Arthur Morley, M.Sc., M.I.Mech.E. London: Longmans, Green and Co. Price *7s. 6d.* net.

NEW COMPANIES REGISTERED.

DRAKE AERONAUTICAL ENGINEERING SYNDICATE, LTD.—Capital £3,000, in £1 shares. Manufacturers of and dealers in toys, aeroplanes, airships and other kinds of aircraft. First directors: C. R. S. Cadell, A. Coote, R. R. Drake and J. Ward.

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Aeronautical Patents Published.

Applied for in 1915.

Published November 2nd, 1916.

14,678. L. SAMPLE. Height indicator for aircraft.
17,433. W. BRIERLEY AND VARIOPLANE Co. Landing-gear for aeroplanes.
17,530. H. O. SHORT. Stay wires of flying machines.

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FLIGHT

First Aero Weekly in the World.

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A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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EDITORIAL COMMENT.

The Air Board Crisis.

IT is with the greatest satisfaction that we regard the active campaign of the newspaper Press respecting the present most unsatisfactory position of the Air Board in its relation to the flying services. The *Daily Telegraph*, on Monday last, published a leading article on the subject, in the main lines of which we concur. The article in question traces the developments which led up to the establishment of the Air Board, whose future is now trembling in the balance, and ends with the cogent remark that the nation has one desire, and one desire only, and that is that both services—the R.N.A.S. and the R.F.C. —shall be provided with the most efficient machines and administered with due regard to the needs of war. It cares nothing for personal or departmental controversies, except so far as the public interests are affected.

That appears to sum up the whole situation in the fewest possible words. The question, however, for the moment is, how are these ideals to be attained with the minimum of delay? We endeavoured to answer the question to the best of our ability when writing on this subject in last week's issue of this journal. In the light of what is being said now, it will assist in the discussion of the points at issue if we repeat what we then wrote, which was this:

> "What is required is not the discussion of academic attempts to reconcile conflicting interests, but the immediate application of a drastic remedy which will relegate existing competition and overlapping to the place they belong. That remedy we believe to be the formation of a central air authority —whether it be the Air Board reconstituted or otherwise— not to interfere initially with the tactical dispositions of either of the two Air Services, but with absolute power in all matters save this and internal administration. It should have—as most people thought the Air Board would have—complete control over all contracts for machines and supplies, thus putting an end to the present ruinous competition between the two services. In or after consultation with the Admiralty and the Army Council it should deal with strategical dispositions in so far as the definition of what may best be described as the respective spheres of activity of the two services are concerned.'

The *Telegraph* does not go quite all the way along these lines. What it suggests—while it admits that this is the line of least resistance and a not altogether satisfactory solution—is the appointment of a strong Committee of the Ministry of Munitions to order material for both services. We do not regard the idea as a practical solution at all, since we are most strongly of opinion that what is required is not a committee of any Ministry, but an authority separate and distinct, whose sole concern should be the Air Services. If we were concerned only with the present, such a Committee might do well enough, but we have had quite enough of stop-gaps. We must have an eye to the future, and what we therefore want is a body which, however much its powers of executive may have to fall short for the present of those of a Third Service, will at least form the nucleus from which such a service must ultimately develop. In the nature of things, a mere committee of a temporary Ministry could not fill the bill. From that point of view alone, we conceive that what must be urgently pressed for is an authority on the lines laid down in the quotation we have printed above. That is the irreducible minimum with which the nation can be satisfied.

Lord Montagu of Beaulieu, in the *Times*, is apparently at one with us on this vital question. He puts it that it may be advisable that during the war the

Air Board should have no power of executive or of influencing the dispositions of personnel, and no-one would claim for it any power as regards actual operations in the field. But it might well ask for and make a point of obtaining, even at the cost of resignations or a stiff Parliamentary fight, the power of supply. There is no reason why it should not become the Q.M.G. Department of the Air Services.

This is exactly on all fours with what we wrote last week. It will do well enough for a start, but it has got to be done at once. As Lord Montagu himself says :—

> "If the Air Board in the next few weeks is not given more powers, and if it is asked to go on acting in a subsidiary and merely advisory capacity, there will be another crisis in the history of national aviation. The Government will find it difficult after two failures to appease the nation or Parliament by suggesting the appointment of yet a third body with no real powers, merely as a sop to clamour and as an excuse for delay."

The whole question is due to be debated in Parliament, and possibly we shall then see where we are. Whether the Government will rise to the occasion remains to be seen. Certain influences appear to be at work which render it at least a little doubtful if anything like serious reform is intended by the inner official circles. Were it not so, we cannot conceive that the Parliamentary Air Committee would have considered it necessary to take the extreme step—for we regard it as such, under all the circumstances—of addressing a letter to all the Lord Mayors, Lord Provosts and Mayors of county boroughs in the Three Kingdoms, asking them to write their approval to the Premier of the resolution passed by the Committee after its meeting with Mr. Balfour last week. This resolution was phrased as follows :—

> "In view of the discussion which took place at a meeting of the Parliamentary Air Committee in the House of Commons to-day, the Executive Committee unanimously reaffirms its strong conviction that the Air Board should be given more extensive and immediate executive powers for the development of both air services."

In some quarters it is said that the Government is riding for a fall. Is it, we wonder ? And if so, will it "take a toss" over the Air Board controversy ?

◆ ◆ ◆

Honours for the Dead.

The War Office has made still another announcement regarding the subject of honouring those who have laid down their lives in the service of the country. The announcement is to the effect that any medal issued in commemoration of the war, gained by officers or men who have died, will be given to the dead heroes' next-of-kin. It is another step in the right direction, but is very far from disposing of the points traversed by us last week, and on previous occasions.

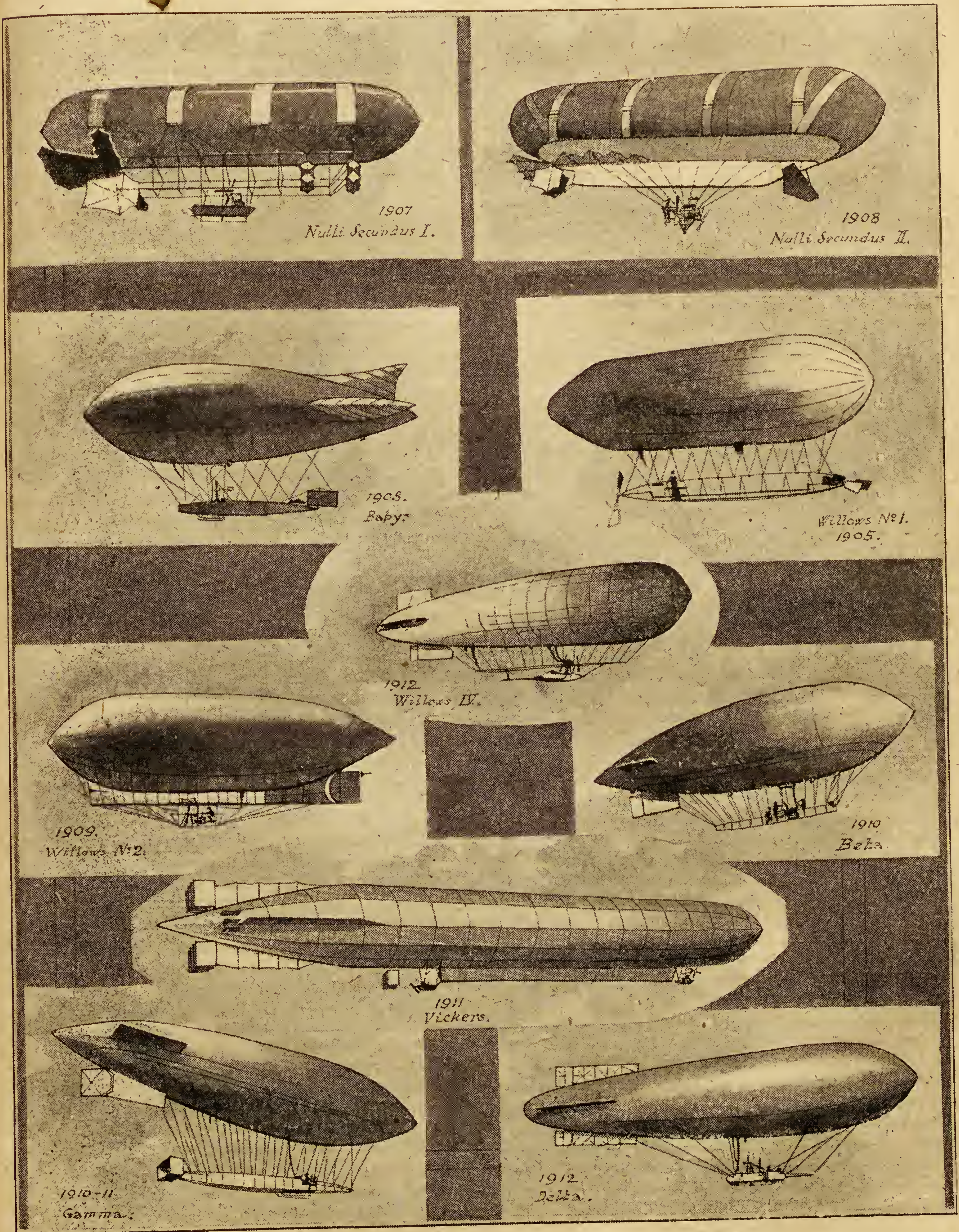
To our way of thinking it is the gravest injustice to the memory of the dead, and to those of their kin who are left, that the officer or man who dies in performing a deed of valour which, had he lived, would have entitled him to a decoration, should, by reason of his supreme sacrifice, be deprived of the honour. It is neither justice nor logic, and in spite of the "difficulties" upon which so much stress is laid, we trust to see another announcement made very soon, removing what is really a shocking anomaly.

The Government and the Press.

Not before it was due, a protest has been registered by Mr. H. W. Massingham against the policy of the Government towards the Press of the country. He points out that the editors of London and Provincial papers have recently been invited to attend a series of private conferences with Ministers, at which they have been addressed confidentially on subjects concerning the war. This method of private conferences, it is urged, represents, so far as the public is concerned, a cumulative effect of concealment and discouragement of liberty of thought and expression. The Coalition stops the normal flow of political criticism. The Defence of the Realm Act places it in the power of the Executive to arrest any strongly adverse judgment on the conduct of the war or the policy of the Government. The censorship exercises a constant pressure, partly suggestive, partly arbitrary, on free opinion and the free circulation of news. The private conference, under the honourable seal of secrecy, sets up a third barrier and the range of permitted subjects is thus further curtailed.

We agree that all this is so. Indeed, it is an exceedingly moderate statement of the case. The Press is muzzled and shackled to an extent which no-one outside the Press itself can possibly realise. Criticism, save of the most vague and general character, is stifled ; comment on almost any subject under the sun is reduced to a mere travesty. Admittedly, at a time like the present, it would be out of the question to allow the same license as in normal times, but there are limits. There would be very little ground of complaint if the embargo on news and comment were intelligently carried out, but that is exactly what it is not. Instead of being administered along definite and intelligible lines, the censorship is apparently a matter very largely of individual caprice. To put the matter plainly, we exist under Prussian regulations, administered with characteristic British official stupidity. The consequence is that our boasted freedom of the Press has become the sorriest travesty. There is no such thing as freedom of expression either in the Press, on the platform or anywhere else, except in the House of Commons, where anyone who catches the Speaker's eye may talk the veriest sedition if he so pleases.

Nor is it only in the suppression of news and comment that the newspaper Press suffers from the capriciousness of the censorship. We could give chapter and verse for more than one case in which serious damage has been done to business interests, and that without reason or explanation given. Indeed, it is of little or no avail to ask for reasons when once the hand of the censor has made itself felt. To such a pass has officialism come that it does not even deign to notice the most courteous request for information when once it has determined on a line of action. The only inference that can be drawn from official silence when a natural request to be informed of reasons for a particular course of action has been proffered is that there are no reasons that will bear stating. There is not the shadow of doubt that we have arrived at the state which the typical official regards as the ideal—that in which the official is the master and the public his slave to



AIRSHIP PIONEERS.—British examples. (*See page 977.*)

do what he will with. And we shall have a great deal of difficulty in persuading him out of that state of mind when the time comes for him to be set back in his place. What a ghastly prospect it all opens up!

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More Female Labour Wanted.

The Ministry of Munitions is asking for more volunteers from among the women of the country to undergo training for work in munition factories. In the official communication conveying the request, it is pointed out that, apart from the numbers needed for new factories and extensions of works already established, many are required to replace the men of military age who are being called to the colours. The demand is for between 800 and 1,000 per week to fill all the gaps!

We doubt not that the appeal of the Ministry will be of effect. The women of the country have risen to the occasion wonderfully and beyond the most sanguine expectations of the early days of the war. That they will respond equally to this and every new call made upon them we have the fullest confidence.

In a recent issue of "Flight," in advocating a further dilution of labour all round, we took the opportunity of pointing out that there is very little to be apprehended from the supposed danger of women taking the place of skilled workers after the war. The communication from the Ministry of Munitions, which we have taken as our present text, once more reminds us of an interesting little sidelight on this aspect of the labour question. It draws attention to the fact, to which we gave publicity many months ago, that the period of training to be undergone by women munition workers who respond to the Ministry's invitation, is from four to six weeks. At the expiration of this time they are passed as being qualified to take their places in the factory.

This, as we have before urged, is a potent argument against the point of view that it is dangerous to the interests of skilled labour to allow "dilution." We put it that it is an absolute endorsement of our own argument that the feared danger is disposed of by the simple fact that the women munition makers and those who have been called upon to take the places of men in other trades and industries have been trained only in one direction. That is to make them as efficient as possible in the shortest time to carry out one particular operation, and one only. In other words, every workwoman is trained with the one idea of making her a specialist. She is of inestimable use for the work in hand now, but a commercially impossible proposition in the mass when it comes to the post-war reconstruction of industries.

We do not think that this aspect of the labour position can be too strongly argued. It is quite natural that the leaders of labour—in fact, it is of the same importance to the entire nation—should look ahead and that they should regard with a certain amount of suspicion anything which may conceivably lead to an upheaval of the whole industrial system.

Not but what all or any measures would have to be adopted in order to win the war, whatever the effect on systems. But if we can fit our measures for the present to the future of our industries, so much the better. The Army wants men—and it must have them. That is the one outstanding fact of the moment. There are thousands of fighting men working in our factories whose places can well be filled by women for the period of the war. We have got to have those men in the ranks of the Army, and we do not believe there is the least risk to the future interests of labour in making the exchange. It could not be helped if there were—we must have the men, and the only way to get them is by still further "dilution."

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The S.B.A.C.

It is not very long since the members of the British aircraft industry decided among themselves that the time had come for them to form a representative body of their own. The results of that decision are to be seen to-day in the Society of British Aircraft Constructors, which, young as it is, has already accomplished a great deal of very useful work and has arrived at a state of organisation which would lead the uninstructed outsider to think that it had been going for twenty years instead of a long way short of as many months.

The scope of the Society is fairly wide, and covers practically every phase of interest connected directly or indirectly with the industry. Apart from its general work, which includes matters so far apart as the instruction of the Legislature and public bodies generally in matters affecting the aerial movement and assisting its members in litigation, the Society already has in full working subsidiary committees which ought to prove of immeasurable benefit to the industry.

It has established an aero engine section, to which all matters relating to engines are referred. The names of the members of this section are a sufficient guarantee in themselves that the vitally important matter of engines will now and in the future receive the full meed of attention it demands. Then there is a Technical Section to which are referred all technical questions affecting aircraft construction as distinct from those matters which fall to be dealt with by the Engine Section, while it is in contemplation to inaugurate other sections as and when the need for them is demonstrated.

The Society is certainly to be congratulated on the splendid progress it has made since its inception, and on the immense amount of work it has done to co-ordinate the communal affairs of what is, after all, an infant industry. It is a great thing to begin when a movement is young rather than to wait until things have become established by custom and have got more or less into a groove from which it is difficult to lift them.

The wisdom of the industry in taking a line for themselves rather than allowing their affairs to remain the concern of a mere sub-committee of another body, has already been made manifest and will become plainer every day as the industry grows in importance, as it must do.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, October 31st.

Sqdn.-Comdr. I. T. Courtney, appointed Actg. Wing Comdr., Oct. 1st.

H. Howard and S. C. Perryman granted temp. commissions as Lieuts., with seniority Oct. 30th.

Admiralty, November 2nd.

The undermentioned have been entered as Prob. Flight Officers for temp. service, and appointed to the "President," additional, for R.N.A.S., all to date Nov. 5th: M. G. Woodhouse, A. H. Garland, R. W. Gant, N. A. W. Owen, R. B. R. Ashworth, G. A. Brown, and G. H. Willows.

Admiralty, November 3rd.

Petty Officer, Mech., R.N.A.S., C. W. Gilbert granted a temp. commission as Engr. Sub-Lieut., R.N.R., with seniority Oct. 6th.

Admiralty, November 4th.

Comdr. R. S. Roy to the "Daedalus," additional, for R.N.A.S., Nov. 3rd.

Temp. Sub-Lieut., R.N.V.R., R. K. Marwood and N. G. Snelling promoted Temp. Lieut., both seniority Nov. 1st.

Prob. Flight Sub-Lieut. (temp.) H. O. Merriman granted a temp. commission as Sub-Lieut., R.N.V.R., and appointed to the "President" for R.N.A.S., to date Nov. 3rd. Appointment as Prob. Flight Sub-Lieut. (temp.) terminated.

The undermentioned have been entered as Prob. Flight Officers, temp., and appointed to the "President" for R.N.A.S., to date as stated: F. C. Cressman, Oct. 16th; H. W. Lee, Francis Stanier, A. W. Evans, and J. A. E. Towles, Nov. 12th.

Admiralty, November 6th.

A. E. Penn and L. H. Pritchard granted temp. commissions as Lieuts., R.N.V.R., seniority Nov. 4th.

J. Kelly and J. Bishop granted temp. commissions as Sub-Lieuts., R.N.V.R., seniority Nov. 4th.

The under-mentioned entered as Proby. Flight Officers for temp. service, all date Nov. 12th: H. T. Pepper, J. P. Barnes, P. W. Pearkes, J. S. A. Fergusson, E. A. M. Waterton, P. G. Stokes-Rees, R. J. Stallard and A. C. Snow.

Royal Flying Corps (Military Wing).

London Gazette Supplement, November 1st.

Temporary Appointments at War Office.

Deputy Assistant Directors.—Capt. A. G. Clark, R.F.C., S.R., from a Staff Capt., vice Capt. E. R. L. Corballis, R. Dub. Fus.; 12th Aug. Temp. Capt. J. S. Nicholson, from a Staff Capt.; Aug. 26th.

Staff Captains.—Maj. I. B. Davson, City of Lond. Yeo. (T.F.), vice Capt. P. R. Grace, R.F.C., S.R.; Aug. 1st. Aug. 26th: Temp. Capt. R. H. Brand, from an Equipment Officer, R.F.C.; Temp. Capt. C. M. Smith, from an Equipment Officer, R.F.C.; Lieut. (Temp. Capt.) C. Hirtzel, R.F.C., S.R., from an Equipment Officer, R.F.C., and to retain his temp. rank whilst so employed, vice Temp. Capt. J. S. Nicholson.

Staff Lieutenants.—Aug. 26th: 2nd Lieut. (temp. Lieut.) H. F. Anns, Lond. R. (T.F.), from an Asst. Equipment Officer, R.F.C.; Lieut. (Temp. Capt.) G. Dugdale, Montgomeryshire Yeo. (T.F.); 2nd Lieut. S. Whitechurch, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C.; Lieut. St. J. R. Pigott, I. Gds., and to be secd.; Temp. Lieut. G. Frecheville, Gen. List.

Squadron Commander.—Capt. A. K. H. O'Brien, 2nd D.G., S.R., from a Flight Comdr., and to be Temp. Maj. whilst so employed; Oct. 4th.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed. Oct. 1st: 2nd Lieut. (Temp. Lieut.) A. F. K. White, Suff. R. (T.F.); 2nd Lieut. (Temp. Lieut.) G. H. Hall, Welsh Horse Yeo. (T.F.); Temp. Lieut. S. R. Stammers, Gen. List; Temp. Lieut. J. T. Milne, Gen. List; Temp. Lieut. J. R. Allan, Gen. List; 2nd Lieut. W. A. McCloughry, 9th Regt., Australian Light Horse; 2nd Lieut. (Temp. Lieut.) C. R. Clapperton, Clyde R.G.A. (T.F.); 18th Oct.

Flying Officers.—The notification in the *Gazette* of Sept. 25th regarding Lieut. G. A. Garveys-Gadd, R.F.A., S.R., resigning his appointment as a Flying Officer, is cancelled.

Equipment Officers, 1st Class.—Aug. 26th: Temp. Hon. Capt. T. B. Morley, and to be Temp. Capt. whilst so employed; Temp. Capt. D. Thomson, Gen. List; Lieut. D. B. Sanders, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C., and to be Temp. Capt. whilst so employed; 2nd Lieut. S. Clark, R.F.C., S.R., from an Asst. Equipment Officer, R.F.C., and to be Temp. Capt. whilst so employed.

Equipment Officer, 2nd Class.—2nd Lieut. E. N. Layton, S.R., from an Equipment Officer, 3rd Class, and to be Temp. Lieut. whilst so employed; Oct. 10th.

Equipment Officers, 2nd Class.—2nd Lieut. A. C. Blackmore, S.R.; July 12th. Lieut. O. I. Preston, Notts. and Derby. R. (T.F.), from a Flying Officer (Observer).; July 17th. Temp. 2nd Lieut. J. M. Macaulay, Gen. List; Aug. 1st.

2nd Lieutenants, Special Reserve.—P. A. Barron; Aug. 10th. H. Lloyd; Sept. 25th. N. Martin; Oct. 23rd.

Memoranda.—Capt. J. Valentine, R.F.C., S.R., a Flight Comdr., R.F.C., to be Temp. Maj. (without the pay and allowances of that rank) whilst specially employed; Oct. 20th. Temp. 2nd Lieut. J. C. C. Affleck, York. R., is transfd. to Gen. List, and to be Temp. Lieut. whilst serving with R.F.C.; Oct. 1st. The undermentioned 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C. Oct. 1st: B. D. Bellamy, Essex R.; J. E. Catherall, R. War. R.; J. D. G. Macrae, Sea. Highrs. The undermentioned 2nd Lieuts., S.R., to be Temp. Lieuts. whilst serving with R.F.C. Oct. 1st: A. L. M. Shepherd, K.R. Rif. C.; G. Philippi, 1st Dns.; F. C. Dixon, Dorset. R. The undermentioned 2nd Lieuts. (on prob.), S.R., are confirmed in their rank, and to be Temp. Lieuts. whilst serving with R.F.C. Oct 1st: G. J. Read, N. Staff. R.; H. F. Champion, Rif. Brig.; R. J. Bevington, R.F.A.; R. E. Meek, Wilts. R. The undermentioned Temp. 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C. Oct. 1st: C. E. Foggin, W. G. D. Turner, E. H. Hall, F Sharpe, Notts. and Derby. R., H. A. Pearson, R.A., R. J. G. Temple, R.G.A.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: P. A. Barron, H. Lloyd, L. M. Barlow. N. Martin to be 2nd Lieut. Oct. 23rd. The undermentioned to be 2nd Lieuts. (on prob.): W. G. Peck; Oct. 14th. G. Dennison; Oct. 15th.

London Gazette Supplement, November 2nd.

Flight Comdrs.—From Flying Officers, and to be Temp. Capts. whilst so emplyd.: 2nd Lieut. (Temp. Lieut.) M. Henderson, D.S.O., Sea. Highrs. (T.F.); April 1st. 2nd Lieut. T. Davidson, Camn. Highrs. (T.F.); Oct. 16th. Capt. H. W. von Poellnitz, Linc. R., from a Flying Officer; Oct. 17th.

Flying Officers.—2nd Lieut. A. E. McKay, Spec. Res.; June 19th. Temp. 2nd Lieut. H. C. Peirce, R.W. Kent R. and to be transfd. to Gen. List; Sept. 28th. Lieut. S. Guillon, Canadian Gen. List; Oct. 13th. Oct. 14th: 2nd Lieut. (Temp. Lieut.) J. P. D. Maclagan, R. Scots, (T.F.), 2nd Lieut. L. M. Barlow, Spec. Res. 2nd Lieut. (Temp. Capt.) R. G. H. Pixley, Lond. Brig. R.F.A. (T.F.); Oct. 15th. 16th Oct.: Lieut. M. D. G. Scott, N. Lan. R., Spec. Res., from a Flying Officer (Observer), with seniority from May 21st. Temp. 2nd Lieut. C. C. Cheatle, York and Lanc. R., and to be transfd. to Gen. List.

Equipment Officer, 1st Class.—Qr.-Mr. and Hon. Lieut. W. Thomas, R.F.C. from an Equipment Officer, 3rd Cl., and to be Temp. Capt. whilst so employed; Sept. 1st.

Equipment Officer, 3rd Class.—2nd Lieut. (Temp. Lieut.) H. Maccoy, London R. (T.F.); Oct. 19th.

Adjutant.—2nd Lieut. D. G. Nairn, Highland Divn. Train, A.S.C. (T.F.) and to be Temp. Lieut. whilst so employed vice Lieut. (Temp. Capt.) R. H. Jerman, R.W. Fus.; Aug. 28th.

Memoranda.—2nd Lieut. E. E. Robb, R.F.C., Spec. Res., to be Temp. Capt. (without the pay and allowances of that rank) whilst serving with the Home Defence Wing; Nov. 3rd. Sergt. S. F. Cody, from R.F.C., to be Temp. 2nd Lieut. for duty with the Mil. Wing of that Corps; Oct. 10th. Acting Corpl. F. R. H. Logan, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Oct. 11th.

Supplementary to Regular Corps.—The notification in the *Gazette* of Aug. 17th regarding the appt. of 2nd Lieut. A. E. Blackmore is cancelled. The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: C. M. W. Park, J. E. R. Avery. A. E. Blackmore to be 2nd Lieut. (on prob.); Aug. 29th.

London Gazette, November 3rd.

Flight Comdr.—Lieut. C. A. Ridley, M.C., R. Fus., from a Flying Officer and to be Temp. Capt. whilst so employed; Oct. 20th.

Flying Officers.—2nd Lieut. (temp. Lieut.) E. R. Farmer, Notts. Yeo. (T.F.); July 20th. Temp. 2nd Lieut. S. F. Cody, Gen. List.; Oct. 10th. 16th Oct: Temp. 2nd Lieut. C. C. Marsden, Gen. List; 2nd Lieut. (on prob.) H. B. Begg, Spec. Res.; Oct. 17th. Temp. 2nd Lieut. (Temp. Lieut.) J. H. Thomas, Manch. R. Temp. 2nd Lieut. (on prob.) W. D. Patrick, Gen. List. Temp. 2nd Lieut. D. M. Macdonald, Gen. List; Oct. 18th. 2nd Lieut. P. B. Boyd, Gord. Highrs., and to be secd.; Oct. 19th.

Flying Officers (Observers).—Oct. 14th.: 2nd Lieut. P. S. Jackson-Taylor, Hereford R. (T.F.); 2nd Lieut. G. C. T. Hadrill A.S.C., and to be secd.; Oct. 16th. Temp. 2nd Lieut. J. A. Gerges, York and Lanc. R., and to be transfd. to Gen. List: Temp. 2nd Lieut. T. K. Twist, Durh. L.I., and to be transfd. to Gen. List: 2nd Lieut. A. Douglas, R.F.A., Spec. Res.; Temp. 2nd Lieut. H. Jackson, R.A., and to be transfd. to Gen. List; Oct. 20th. Capt. H. G. ffiske, R.F.A. (T.F.); Temp. 2nd Lieut. O. D. Norwood, A.S.C., and to be transfd. to Gen. List.

Equipment Officers, 3rd Class.—Aug. 1st: Temp. Lieut. H. Fernihough, Welsh R., and to be transfd. to Gen. List. 2nd Lieut. W. D. South, R. War. R. (T.F.) Temp. 2nd Lieut. M. L. Horn, Gen. List.; 2nd Lieut. J. E. R. Avery, Spec. Res.; Temp. 2nd Lieut. W. T. H. Hocking, Gen. List; 2nd Lieut. C. M. W. Park, Spec. Res. Temp. 2nd Lieut. C. E. Morgan, Gen. List; Oct. 4th. Oct. 18th.: 2nd Lieut. (Temp. Lieut.) C. A. H. Mason, E. Surr. R. (T.F.); 2nd Lieut. (on prob.) J. Paradise, Spec. Res.

London Gazette Supplement, November 4th.

Sqdn. Comdr.—Lieut. (Temp. Capt.) F. W. Goodden, Spec. Res., from a Flight Comdr., and to be Temp. Maj. whilst so employed; Oct. 23rd.

Flight Comdr.—The appointment of Temp. Capt. D. K. Johnstone, Gen. List, notified in the *Gazette* of Aug. 19th, is antedated to Apr. 1st.

Flying Officers.—Temp. 2nd Lieut. D. S. Allan, Gen. List; Oct. 8th. Oct. 17th: 2nd Lieut. (Temp. Lieut.) H. E. Read, Linc. Yeo. (T.F.); Temp. 2nd Lieut. H. E. Arnold, Gen. List; 2nd Lieut. M. R. Helliwell, Spec. Res. Lieut. F. C. Barrell, L'pool. R. (T.F.); Oct. 18th.

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Sir D. Haig on Recent R.F.C. Work.

IN his review of events from October 19th to the end of the month, issued for General Headquarters on October 31st, Sir Douglas Haig says: "Towards the end of the month, the enemy artillery became more active, and enemy aeroplanes were more in evidence. This increased activity has been satisfactorily dealt with by our own guns and aircraft."

R.N.A.S. Officers and Tuition Fees.

AN Order in Council, published in the *London Gazette* of November 7th, provides that commissioned and warrant officers who qualify for the Royal Aero Club's pilot's certificate at their own expense before entering the Royal Naval Air Service, shall have their tuition fees refunded up to a limit of £75, thus granting to R.N.A.S. officers a concession which has been given to R.F.C. officers for several years.

It is stipulated that payment shall not be made until confirmation in rank, or two months' service in the case of officers confirmed on entry, and that officers who resign or are discharged for causes within their own control within three years of entry may be required to repay the whole or a part of the sum received.

P.O. Air-Raid Insurance Certificates.

AN official notice reminds holders of aircraft insurance certificates taken out a year or more ago, that they now cease to be in force; new certificates must be taken out if it is desired to continue the insurance. The Government will not be liable for any loss or damage sustained between the time of expiry of one certificate and the issue of another in respect of the same property.

Full particulars regarding the certificates can be obtained at any post office.

At the same time, it may be timely to remind holders of Government air-raid insurance policies to make a note of the expiry of the insurance, as no renewal notices are sent out, as in the case of ordinary insurances.

The Lord Mayor's "L.15" Medals.

ONE of the last but most pleasurable duties of the Lord Mayor, Colonel Sir Charles Cheers Wakefield, before going out of office was to hand over to General Headquarters, Home Forces, at the Horse Guards, 353 gold medals for distribution to that number of officers and men who were instrumental in bringing down "L. 15" on the night of March 31st—April 1st, 1916, on the Thames Estuary. This distribution is the outcome of the offer made last year by Sir Charles of £500 to the first person or persons who might bring down a Zeppelin on British soil.

The Society of British Aircraft Constructors.

FULL details regarding the formation and constitution of the Society of British Aircraft Constructors were given in our issue of April 20th last, and since then we have noted the various additions to the membership. A fully representative body, the S.B.A.C. should have the support of every firm in the industry, so that its work in assisting—both commercially and scientifically—its members may be prosecuted to the full.

There is a General Council of the Society consisting of such number of members (or representatives of members) as shall be determined from time to time, and the general management of the Society's business is in the hands of a Committee consisting of fourteen members of the Council. The present Committee of Management consists of Messrs. H. White Smith (*Chairman of the Society*) (The British & Colonial Aeroplane Co., Ltd.), B. Caillard (Wolseley Motors, Ltd.), R. O. Cary (The Sopwith Aviation Co., Ltd.), L. Coatalen (The Sunbeam Motor Car Co., Ltd.), Hamilton Fulton (Martinsyde, Ltd.), N. G. Gwynne (Gwynnes, Ltd.), E. B. Parker (Short Brothers), E. W. Petter (Westland Aircraft Works), H. V. Roe (A. V. Roe & Co., Ltd.), J. D. Siddeley (The Siddeley-Deasy Motor Car Co., Ltd.), G. Holt Thomas (The Aircraft Manufacturing Co., Ltd.), H. T. Vane (D. Napier & Son, Ltd.), Major H. F. Wood (Vickers, Ltd.), Howard T. Wright (J. Samuel White & Co., Ltd.).

An Aircraft Engine Section of the Society has been formed, and all aircraft engine matters are referred to this Section, the present Committee of which is as follows:—G. Holt Thomas (*Chairman of the Section*) (Gnome & Le Rhone Engine Co.), W. H. Allen (W. H. Allen Son & Co., Ltd.), A. F. Bennett (Messrs. Willans & Robinson, Ltd.), B. Caillard (Wolseley Motors, Ltd.), L. Coatalen (The Sunbeam Motor Car Co., Ltd.), A. H. R. Fedden (Brazil, Straker & Co., Ltd.), N. G. Gwynne (Gwynnes, Ltd.), L. J. Le Mesurier (Sir W. G. Armstrong, Whitworth & Co., Ltd.), F. May (Green Engine Co., Ltd.), J. D. Siddeley (The Siddeley-Deasy Motor Car Co., Ltd.), H. T. Vane (D. Napier & Son, Ltd). A Technical Section of the Society has also been formed, for which technical representatives are nominated by members. It is desired that the constitution and scope of this section shall be as unrestricted as possible, the object being to obtain the assistance of all members—both ordinary and associate—on technical matters, and particularly in respect of matters of which they have special knowledge. Other sections of the Society will be formed as and when they are required.

The Secretary of the Society is Mr. C. V. Allen, and the offices are at St. Stephen's House, Victoria Embankment, Westminster, S.W.

AIRSHIP PIONEERS

(*Continued from p. 958.*)

FROM 1902 onwards, commencing with the first semi-rigid airship, "Le Jaune," constructed by the Lebaudy Bros., the development of the airship became much more rapid, especially in France. It would be impossible, with the space at our disposal, to give a complete record of every airship built, nor would it be necessary, as many of them were exactly similar. It is therefore proposed to deal with the original of each type, and then only refer to those of its

TABLE OF AIRSHIPS BUILT AND TRIED OUT.

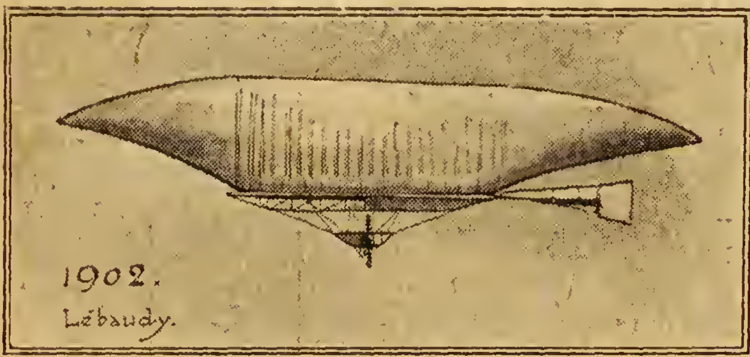
Year.	Name.	Country.	Type.	Propulsion.	Length.	Diameter.	Volume.
					ft.	ft.	cu. ft.
1784	Chartres (Bros. Robert)	F.	N.R.	Manual	52	32	30,000
1784	Meusnier	F.	N.R.	,,	—	—	—
1789	Scott	F.	N.R.	Ballonets	—	—	—
1834	Lennox	F.	N.R.	Manual	130	35	99,000
1848	Partridge	E.	R.	—	—	—	—
1851	Meller	—	R.	—	—	—	—
1852	Giffard No. 1	F.	N.R.	3 h.p. steam	144	40	88,300
1855	,, ,, 2	F.	N.R.	3 ,, ,,	230	33	113,000
1870	Dupuy de Lôme	F.	N.R.	Manual	118	49	122,000
1872	Haenlein	G.	S.R.	3 h.p. gas	165	30	85,000
1883	Tissandier	F.	S.R.	1½ h.p. elec.	92	30	37,500
1884	Renard and Krebs	F.	N.R.	9 ,, ,,	165	27	66,000
1880 1897	Wölfert	G.	N.R.	8 ,, ,, *	92	28	28,300
1895	Schwarz	G.	R.	12 h.p. Daimler*	156	39	130,600
1898	Santos Dumont No. 1	B.	N.R.	3 h.p. De Dion	82	11½	6,350
1899	,, ,, 2	B.	N.R.	3 ,, ,,	82	12½	7,060
1899	,, ,, 3	B.	N.R.	3 ,, ,,	66	24½	17,650
1900	,, ,, 4	B.	N.R.	7 h.p. Buchet	129	17	15,000
1900	,, ,, 5	B.	N.R.	12 ,, ,,	109	17	19,000
1901	,, ,, 6	B.	N.R.	12 ,, ,,	108	19¾	22,650
1901	,, ,, 7	B.	N.R.	60 ,, ,,	164	26	44,500
1901	,, ,, 9	B.	N.R.	3 h.p. Clement-Bayard	50	18	7,720
1901	,, ,, 10	B.	N.R.	20 ,, ,,	157	28	71,000
1901	Roze	F.	—	—	—	—	—
1901	Bradsky	G.	S.R.	16 h.p. Buchet	111	20	30,000
1902	Severo	S.	S.R.	12 and 24 h.p. Buchet	98	40	84,750
1903	Barton	E.	N.R.	(3) 50 h.p. Buchet	176	43	235,000
1902	Lebaudy No. 1 (Julliot)	F.	S.R.	35 h.p. D.-Mercedes	187	32	80,670
1903	Ville-de-Paris (Tatin)	F.	N.R.	—	—	—	—
1906	,, (Surcouf)	F.	N.R.	70 h.p. Argus	203	34	113,000
1905	Willows No. 1	E.	N.R.	7 h.p. Peugeot	74	18	12,500
1906	Vaulx (Zodiac II)	F.	N.R.	45 h.p. Ader	106	21	25,000
1906	Parseval No. 1	G.	N.R.	85 h.p. Daimler	157	28	117,000
1906	Wellman (America I)	A.-F.	S.R.	80 ,, ,,	184	52	300,000
1907	Gross No. 1	G.	S.R.	25 h.p. Mercedes	131	39	63,600
	,, M. 1 (rebuilt 1912)	G.	S.R.	(2) 75 h.p. Mercedes	243	36	194,200
1907	Nulli Secundus No. 1	E.	S.R.	50 h.p. Antoinette	111	30	85,000
1908	,, ,, 2	E.	S.R.	50 ,, ,,	120	26	56,000
1908	Zodiac 1 (*Le Petit Journal*)	F.	N.R.	16 h.p. Clerget	98	23	24,700
1908	Malécot	F.	S.R.	28 ,, ,,	108	24	37,300
1908	Torres-Quevedo	S.	N.R.	(2) 24 h.p. Antoinette	118	33	35,000
1908	Clement-Bayard 1	F.	N.R.	120 h.p. Clement-Bayard	183	35	123,620
1908	Italian (Ricaldoni) 1	I.	S.R.	100 ,, ,,	206	33	88,300
1909	,, ,, 1 *bis*	I.	S.R.	120 ,, ,,	216	36	122,000
1909	,, Forlanini 1	I.	S.R.	40 h.p. Antoinette	131	64	122,000
1909	Willows No. 2	E.	S.R.	30 h.p. J.A.P.	86	22	21,000
1909	"Belgique" (Godard)	F.	N.R.	(2) 55 h.p. J.A.P.	180	32	29,000
1910	Wellman (America 2)	A.	S.R.	(2) 80 ,, ,,	228	52	325,000
1910	Willows No. 3	E.	S.R.	30 h.p. J.A.P.	120	23	32,000
1909	British Army, "Baby"	E.	N.R.	(2) 8 h.p. Buchet	84	35	21,000
1910	,, "Beta"	E.	N.R.	30 h.p. Green	104	25	21,000
1910	,, "Gamma"	E.	N.R.	(2) 50 h.p. Green	152	30	70,300
1912	,, "Delta"	E.	N.R.	(2) 50 ,, ,,	152	30	70,300
1913	,, "Eta"	E.	N.R.	(2) 50 ,, ,,	152	30	70,300
1910	Siemens-Schuckert 1	G.	S.R.	(4) 125 h.p. Mercedes	387	43	460,000
1910	Schütte-Lanze 1	G.	R.	(2) 270 ,, ,,	430	60	690,000
1911	,, 2	G.	R.	(4) 180 h.p. Maybach	470	60	780,000
1911	Suchard	G.	N.R.	(2) 110 h.p. N.A.G.	249	52½	423,840
1911	Vickers (Naval)	E.	R.	(2) 200 h.p. Wolseley	510	48	706,330
1911	Yamada	J.	N.R.	50 h.p. Korting	115	24	49,500
1911	Astra-Torres 1	F.	N.R.	55 h.p. Chenu	157	33	68,150
1912	Willows No. 4 (Naval)	E.	S.R.	35 h.p. Anzani	100	20	24,000
1912	Spiers (rebuilt 1913)	F.	R.	(2) 200 h.p. Chenu	460	43	578,000
1912	Veeh	G.	S.R.	(2) 130 h.p. Mercedes	230	41	32,150
1912	Italian M. 1	I.	S.R.	(2) 250 h.p. F.I.A.T.	272	56	424,000

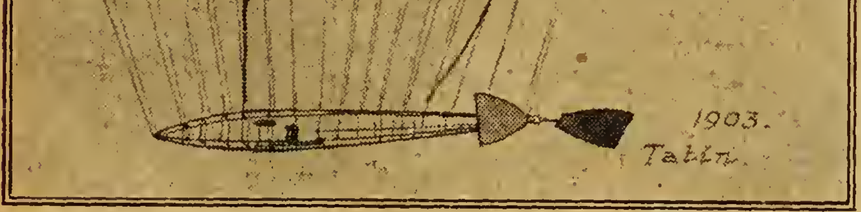
A. = American. B. = Brazilian. E. = English. F. = French. G. = German. I. = Italian. J. = Japanese. S. = Spanish.
N.R. = Non-rigid. R. = Rigid. S.R. = Semi-rigid.

* Benzine engine.

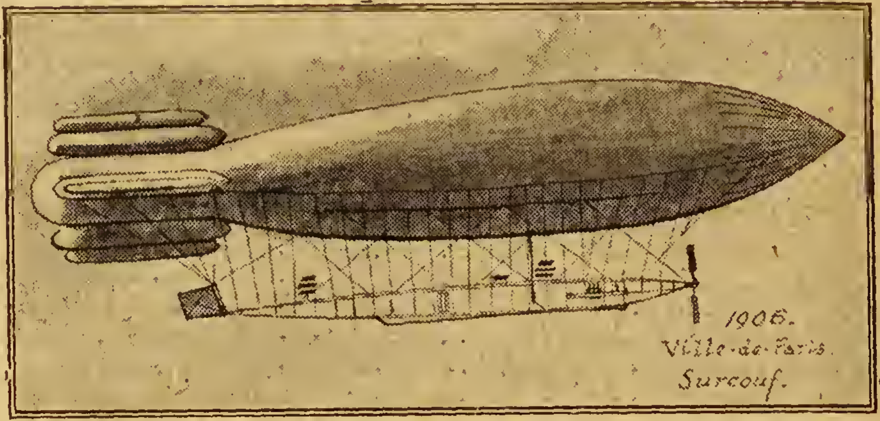
successors which possessed outstanding differences in design or construction.

The brothers Paul and Pierre Lebaudy, wealthy sugar refiners, inspired by the success of Santos Dumont, commissioned a skilful engineer, M. Julliot, to construct a dirigible on more practical lines. With the help of M. Surcouf, a ship was completed by October, 1902, and made a successful trial flight. It possessed several novel features, the most important of which was the attachment of the cigar-shaped envelope (187 ft. × 32 ft., capacity 80,670 cub. ft.) to a platform or keel, consisting of a framework of steel tubes, to the rear extensions of which horizontal and vertical planes were attached. Suspended from the keel, by means of 24 steel rods, was the car containing a 35–40 h.p. Mercedes engine driving a 9 ft. propeller mounted in rigid framework on each side of the car, the thrust from the propellers being transmitted from the car to the keel by a rigid framework of steel tubes. For more than a year "Le Jaune" made numerous successful flights, until in November, 1903, after a flight from Paris to Chalais–Meudon, in a wind of about 18 m.p.h., it was dashed against a tree on landing and destroyed. It was re-built in 1904 and considerably improved, the envelope being increased to some 92,000 cub. ft., and given a rounded, instead of a pointed, stern. Stabilising fins were also added to the stern of the envelope, as well as elevating planes at the sides and midships. Known as the "Lebaudy," it made many ascents and long trips, under the eye of the French War Minister, until it met with a similar fate to "Le Jaune" in July, 1905. By now much valuable data had been obtained, and with the appearance, and presentation to the French Government, of the third Lebaudy airship, "Lebaudy" rebuilt, in the close of 1905, there started a regular output of similar vessels from the factory which eventually arose at Moisson.

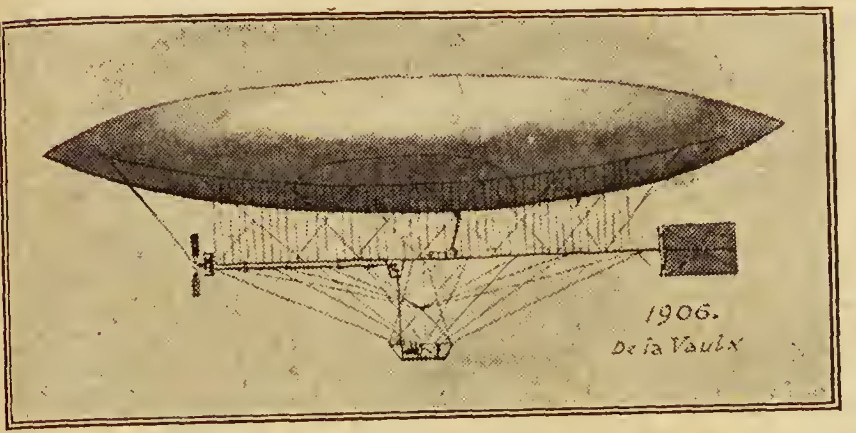




M. Deutsch de la Meurthe, a keen follower of the dirigible, had a small airship built to the designs of M. Tatin in 1903. It had a slim, cigar-shaped envelope, below which was suspended a long rectangular-section *nacelle*, with a propeller mounted at the rear. The trials were by no means successful, and so another ship, the "Ville-de-Paris," was constructed to the designs of M. Surcouf, in 1906. The "Ville-de-Paris" was the largest airship, next to the Zeppelins, that had been built up to that time, and, like the Lebaudys, was the forerunner of many subsequent ships of a similar type, known as the "Astra" class. It measured 203 ft. long by 34 ft. diameter, and had a capacity of 113,000 cub. ft. The envelope was cigar-shaped, with a peculiarly shaped stern, which consisted of a small cylindrical projection having eight smaller cylindrical balloons arranged around it in groups of two, as clearly shown in the illustration. These cylinders took the place of the stabilising planes, built up of a fabric-covered framework, hitherto employed on dirigibles. An air ballonet—by this time recognised as being a most necessary part of the dirigible—and five valves (four were automatic) were employed. A long, rectangular-section *nacelle* was suspended by lines from two rows of strong canvas bands sewn along the envelope from nose to stern, just below the equator line. The engine, a 70 h.p. "Argus," mounted in the fore part of the *nacelle*, drove a tractor screw 20 ft. in diameter. The pilot and control gear were located almost amidships, and above the stern of the *nacelle* were a rudder and elevating planes. A series of mishaps dogged the preliminary trials, but eventually, after minor improvements had been carried out, many successful ascents were accomplished. In 1908, after the first of the Lebaudy airships, "La Patrie," bought by the French Government, was blown away, the "Ville-de-Paris" was presented to the Government to replace her until a new vessel could be built.



In the meantime, in England, during 1904–5, E. T. Willows had constructed a small dirigible. It had a cylindrical envelope, of Japanese silk, with rather blunt conical ends, and measured 74 ft. × 18 ft. × 12,000 cub. ft. Suspended below the envelope, by means of diagonally crossed lines, was a long triangular-section *nacelle* built up of light steel tubing. Mounted at the rear was a 10 ft. propeller, whilst in front was a pair of swivelling tractor screws, employed for steering the ship in a horizontal as well as a vertical plane; no rudders or elevators were used. The propeller and steering screws were driven by a 7 h.p. Peugeot engine located, with the pilot, somewhat far back in the *nacelle*. As the succeeding ships constructed by E. T. Willows are of special interest, it may be as well to review these *en masse* before dealing with the other types of 1906. On the data obtained from the experiments with No. 1, a second ship was completed in 1909. This was practically of the semi-rigid type, for the envelope—which was much larger, measuring 86 ft. × 22 ft. × 21,000 cub. ft.—was attached to a keel of bamboo and steel, from which was suspended, by steel cables, a small *nacelle*. At the rear of the keel was mounted a rudder for horizontal steering, but steering in the vertical plane was effected by means of two propellers, mounted one on each side of the *nacelle*, which were made to swivel so as to give an upward or downward thrust. The engine employed was a 30 h.p. J.A.P. After many successful trips, including one from Cardiff to London, in 1910, this little ship was re-built, and (enlarged and improved) flew from London to Paris with a passenger (F. W. Goodden, now Major, R.F.C.). In 1912 No. 4 was built, and had the honour of forming a part of the British naval air fleet. Although of the same general lay out, No. 4 differed from the previous model in that the envelope tapered appreciably rearwards from a maximum diameter of some 20 ft. near the nose, and that the 35 h.p. Anzani engine, driving two swivelling 4-bladed propellers, was mounted on the keel above a "torpedo" boat suspended from the latter. The boat, carrying pilot and passenger, enabled the ship to alight on water. Originally a vertical fin and rudder were mounted at the rear of the keel, but later these were replaced by surfaces on the stern of the envelope itself. In 1913, No. 5, a similar ship, was con-

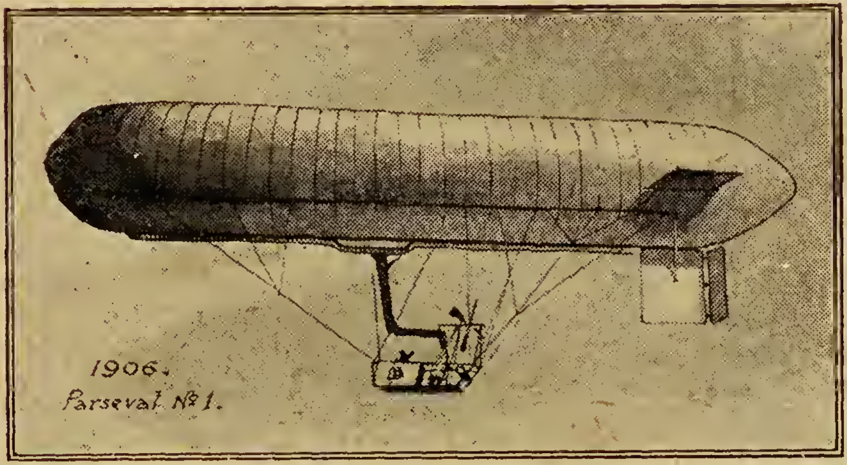


structed at Hendon aerodrome, where it made several short trips.

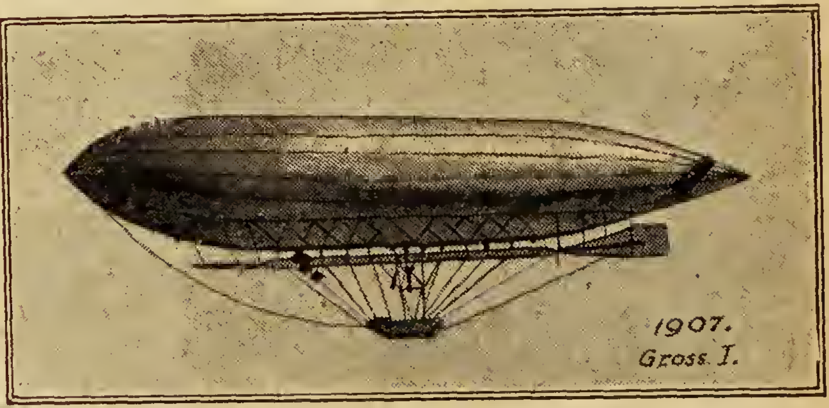
Returning to the year 1906, Comte de la Vaulx, in conjunction with M. Maurice Mallet, carried out some trials with a medium-sized airship. It had an elongated ellipsoidal shaped envelope attached to a long tubular keel, from the centre of which was suspended a small car containing the engine. Mounted at the forward end of the keel was a tractor screw, which was driven from the engine by telescopic shafting and bevel-gearing. The air-ballonet pump was mounted on the keel in the centre and was driven off the bevel gear at the top of the vertical shaft from the engine. The rudder was mounted at the rear end of the keel.

The same year a retired German officer, Major von Parseval, built an experimental airship possessing one or two very interesting features. The envelope, which was cylindrical in shape, with a rounded nose and conical stern, contained two ballonets, one forward and one aft. These ballonets were employed for altering the longitudinal trim of the ship, by pumping air into one and deflating the other. Another feature was the suspension of the car containing the power plant and crew. The suspension lines passed over a system of pulleys which enabled the car to swing a small amount fore and aft, and thus alter its position in relation to the envelope according to the variations of propeller thrust. The trials of No. 1 were apparently satisfactory, for subsequent Parsevals were of practically the same design, differing only in dimensions and minor details—such as a finer shape of envelope, and the employment of two propellers instead of one, &c.

Another German officer, Major Gross, also experimented with a small dirigible in 1907. This was of the semi-rigid type, the cigar shaped envelope being attached to a long T-shaped keel or framework of steel and aluminium tubing. Mounted on each side of the keel, in the centre of the ship, was a propeller, the drive from the engine, a 25 h.p. Mercedes, located in the car suspended from the keel, being obtained by means of belts. The Parseval system of ballonets, and horizontal planes, were employed for the longitudinal control, and a rear extension of the keel terminated in a cruciform stabilising tail to which was hinged a rudder. The results obtained from this experimental ship, though poor, resulted in a larger and improved model being built the following year and put into military serivce as M1. This ship created a record by making an out-and-home trip of 176 miles in 13 hours; it was re-built in 1909 and again in 1912, being enlarged on each occasion. Numerous other models were turned out from time to time, but the only radical alterations in design made were in mounting the propellers directly on the car, and in the case of M4, the employment of two separate cars.



America's share in the development of the dirigible in 1906 was the construction of an airship with which it was hoped to reach the North Pole. This ship, the "America," which was built in France by M. Godard for Mr. Walter Wellman, was practically a combination of the Santos Dumont No. 9 and the "Lebaudy." The stumpy envelope was attached to a rigid keel, from which was suspended a long *nacelle*, of steel tubing, containing an enclosed central section forming the engine room and sleeping cabin. Two engines of 50 h.p. and 25 h.p. respectively were employed to drive a tractor and a propeller mounted at the ends of the *nacelle*. A small 5 h.p. motor operated the air-pump for the ballonet, and a specially designed guide rope, or equilibrator, was employed for maintaining vertical equilibrium. The start for the Pole was made on September 2nd, 1907, but after a two hours' tussle with a strong wind a descent was made upon a glacier, and certain damage resulting, the expedition was abandoned. Later the "America" was rebuilt for a Trans-Atlantic flight, which also ended in failure. "America II" differed in the arrangement of the keel, or car, and minor details. The keel was built up of steel tubes, and extended nearly the full length of the envelope. The lower central portion, carrying the engines, stores, crew, &c., was a long cylindrical tank containing the petrol. There were two engines of 80 h.p., mounted at right angles to the axis of the ship. Both engines drove a port and starboard propeller through bevel gearing. that of the rear pair being of the swivelling type for the purpose of vertical steering. Except for a small opening in the centre, the keel was covered with fabric, and thus provided the crew with more or less protected accommodation. A small donkey engine of 10 h.p. supplied air to the ballonets, of which there were eight. A novel form of equilibrator was employed; this consisted of thirty cylindrical tanks strung together on a steel cable, the entire length being 330 ft. These tanks each contained petrol, and could, when required, be drawn into the car. As the ship lightened with the consumption of fuel, a proportional quantity of gas had to be expelled from the envelope, but instead of allowing it to escape into the air, it was used as fuel for the forward engine, which had been adapted for this purpose. With a view to emergencies, a 27 ft. life-boat, well stocked with provisions, was slung underneath the keel. Horizontal steering was effected by a tri-plane rudder at the rear of the keel. The start for the Trans-Atlantic flight was made on October 15th, 1910, and after three days of misfortune following misfortune, the crew of the "America" were picked up in the Atlantic after abandoning the airship and taking to the life-boat.



The year 1907 saw the appearance of the first British Government airship, "Nulli Secundus," and for the sake of convenience, it is proposed to deal with the succeeding ones, at once. "Nulli Secundus" had a cylindrical envelope of goldbeater's skin, with spherical ends. Suspended beneath the envelope, by means of a net and four silk bands, was a triangular steel framework, or keel, from which was suspended a steel *nacelle*. A 50 h.p. Antoinette engine, mounted in the bows of the latter, drove two propellers, one on each side, by belting. At the rear of the keel were mounted a rudder and horizontal planes for steering, whilst two pairs of movable horizontal planes were also fitted in front. As the use of goldbeater's skin enabled a higher pressure of gas to be maintained, no ballonets were employed, but, of course, relief valves were provided. "Nulli Secundus" made numerous flights at Farnborough, but after a flight to London, was weather-bound, before the return journey could be made, at the Crystal Palace, where it was rather roughly handled by a gale, and had to be dismantled and sent back to Farnborough. In 1908, however, "Nulli Secundus II" made its appearance, with several modifications in design. The envelope had been increased in length, and the keel and envelope were united by a covering of silk fabric. The steering planes and ears had also been simplified. In spite of the "improvements," however, "Nulli Secundus II" was hardly a success, though no doubt much useful data was obtained, and shortly after it was broken up. It was not until the following year that the next Army dirigible came forth, in the shape of a small, and rather pretty, vessel, with a somewhat stumpy, fish-shaped envelope, measuring 84 ft. × 35 ft., capacity 21,000 cubic ft. It had two horizontal and one vertical inflated fins at the stem, somewhat after the manner of the "Ville-de-Paris." Suspended below the envelope was a medium-sized *nacelle*, containing two 8 h.p. Buchet engines, driving a propeller mounted above. A rudder and elevator were mounted at the stern of the *nacelle*. In 1910 a larger ship, No. 2A, was turned out, having a cigar-shaped envelope with two inflated horizontal stabilising fins on the tail, and with a long *nacelle* suspended below. The latter contained an 80 h.p. Green engine driving through swivelling transmission of the Willows type two side propellers. Then followed another small airship, made up mostly from "Baby," called the "Beta." It had a similar form of propulsion as the previous ship, and enjoyed a comparatively long life, accomplishing many successful flights, and undergoing not a few modifications. Shortly after the completion of "Beta," the "Gamma" made its appearance. This ship was similar to No. 2A, but larger—it was, in fact, the largest built at the factory. In 1910 two airships were obtained from France, the "Clement-Bayard II" and "LebaudyVIII" ("Morning Post"), both of which eventually came to grief after journeys from France to England. In 1912 another ship, the "Delta," similar in size to No. 2A, but differing in that it had a boat-shaped car instead of the long *nacelle*, was produced. The "Delta" was followed in 1913 by a sister ship, the "Eta." At about this time the fleet of airships—what there was of it—was taken over by the Admiralty. In addition to these ships, the Naval fleet included a Parseval (No. 18), an Astra-Torres (No. 14), and the Willows No. 4. A rigid airship was completed in 1911 at the works of Messrs. Vickers Sons and Maxim, but never made a flight, for on being taken out of its shed at Barrow it was broken in half by being blown against the sides of the hangar. It was never rebuilt. The "Mayfly," as it came to be known, measured 510 ft. long by 48 ft. diameter, and had a capacity of 706,330 cubic ft. In appearance it was strikingly similar to the modern Zeppelin, except that it had two gondolas connected by a covered, internal "cat-walk," with a cabin in the centre as in the "Hansa" type. Each gondola had a 200 h.p. Wolseley engine, the forward one driving two side screws, and the rear one a single propeller at the stern of the gondola. Horizontal and vertical fins and multi-plane elevators and rudders were mounted on the tail, as well as small elevators in front.

(*To be concluded.*)

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Previously reported Missing, now reported Not Missing.

Flight Sub-Lieut. A. J. Chadwick, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. L. C. Fawkner, R.F.C.
Lieut. S. Haywood, E. Lancs., attd. R.F.C.
Lieut. J. C. Jervis, R.F.C.
Capt. L. H. King-Harman, R.H.A., attd. R.F.C.
2nd Lieut. W. A. M. Niven, R.F.C.

Previously reported Wounded, now reported Died of Wounds.

2nd Lieut. J. A. Simpson, R.F.C.

Previously reported Missing, now reported Died of Wounds.

2nd Lieut. C. C. Hann, R.F.C.
2nd Lieut. F. G. W. Marchant, R.W. Kent and R.F.C.

Died of Wounds.

16186 2nd Air Mech. H. H. R. Rolfe, R.F.C.

Wounded.

2nd Lieut. V. Bayley, King's (Liverpool) attd. R.F.C.
2nd Lieut. W. C. Crawford, Mach. Gun Corps and R.F.C.
2nd Lieut. J. S. Smith, N. Staffs. and R.F.C.

Missing.

2nd Lieut. G. R. Bolitho, Devonshire, attd. R.F.C.
2nd Lieut. W. M. Carlyle, R.F.C.
2nd Lieut. J. Collen, R. Inniskilling F., attd. R.F.C.
2nd Lieut. A. J. Fisher, R.F.C.
2nd Lieut. W. Fraser, R.F.C.
2nd Lieut. P. F. Heppell, R.F.A. and R.F.C.
2nd Lieut. H. B. O. Mitchell, M.C., R. Inniskilling F., attd. R.F.C.
2nd Lieut. G. A. Palfreyman, Buffs (E. Kent), attd. R.F.C.
2nd Lieut. F. G. Parsons, R.F.C.
2nd Lieut. M. Sharpe, R.F.C.
2nd Lieut. S. N. Williams, R.F.C.

Previously reported Missing, now reported Wounded and Prisoners of War in German hands.

2nd Lieut. J. D. A. Macfie, Black Watch, attd. R.F.C.
Capt. H. G. Salmond, R.F.C.

Prisoner of War in German hands.

2nd Lieut. A. F. Organ, R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. R. N. Carter, Dorest, attd. R.F.C.
Lieut. L. B. Helder, R. Fus., attd. R.F.C.
2nd Lieut. K. F. Hunt, Yeomanry and R.F.C.
Lieut. R. R. Money, E. Yorks., attached R.F.C.
2nd Lieut. C. Smith, R.F.C.

Previously reported Prisoner of War, now reported Exchanged Prisoner of War and Transferred to India.

1414. Air Mech. J. Hogg, R.F.C.

Meteorology and Air Work.

In the annual report of the Meteorological Committee for the year ended March 31st last, there are the following references to work in connection with aircraft:—

Professorship of Meteorology to the Royal Flying Corps.—In view of the importance of co-ordinating the experience of flying officers with the work of the Office and Observatories in order to obtain more effective knowledge of the structure of the atmosphere for the use of the air services, the Committee represented to the Director of Military Aeronautics the desirability of appointing a Professor of Meteorology to the Royal Flying Corps (with the rank of Major during the war). The Director of Military Aeronautics concurred, and, with the sanction of your Lordships, the Army Council approved the appointment of Lieut. G. I. Taylor, R.F.C., to that office. Major Taylor was Schuster Reader in Meteorology from February 20th, 1912. His services were lent by the Committee to the Board of Trade for meteorological work on the s.s. "Scotia," chartered for the investigation of ice in 1913. The report of the work of that voyage marks a new epoch in the history of meteorology. The mathematical aspects of work therein contained were developed and extended in an essay which obtained the Adams Prize of the University of Cambridge. At the outbreak of war Mr. Taylor was recommended to the R.A.F., and thence obtained a commission in the R.F.C. The Professorship dates from Feb. 14th, 1916, and is attached to the Meteorological Office.

Departmental Divisions, Observatories, Branches, and Stations.—All the establishments in connection with the Office have been regularly maintained in effective operation. The Branch Office at South Farnborough, which has been in charge of Capt. C. J. P. Cave, of the Meteorological Section R.E., has been specially engaged in the investigation of the occurrence of thunderstorms for the Advisory Committee for Aeronautics, with a view to anticipating their arrival in threatened localities.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Suspension of Entrance Fees of New Service Members.

UNTIL further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

New Club Premises.

It is hoped that the new premises of the Club at No. 3, Clifford Street, New Bond Street, W., will be opened in December.

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to Oct. 31st, 1916..	10,880	14	5
J. Glen Steel	1	1	0
Sydney Schiff	5	5	0
Total, November 7th, 1916	10,887	0	5

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

AVIATION IN PARLIAMENT.

Quality and Quantity.

CAPTAIN BENNETT-GOLDNEY, in the House of Commons on October 31st, asked the Secretary of State for War if he can say whether the War Office is satisfied with the quality and quantity of our aircraft output; if not, whether any defect or deficiency can be attributed to the present system of dual control and administration; and whether the Army Council is now in favour of a reconstructed or numerically strengthened Air Board with responsible executive powers?

Major Baird (representing the Air Board): I have been asked to answer this question. The matters to which it refers are dealt with in a Report which Lord Curzon, as President of the Air Board, has recently made to the Government. This Report is now under consideration, and it is not for the moment possible for me to say anything further on the subject.

Mr. Billing: Does the hon. gentleman propose to lay the Report on the Table of the House?

Major Baird: That question ought to be addressed to the Prime Minister.

Zeppelin Raid Warnings.

MR. BILLING asked the Home Secretary whether he has received a petition presented by the people of the town of Hertford to the chief magistrate, begging for official intimation to be given to those desiring it of the imminence of Zeppelin raids, and also asking for due notification of the passing of the danger; and, if so, what action he proposes to take?

Mr. Samuel: I have received the petition which was forwarded to me by the hon. Member, and I have communicated with the acting chief constable, who considers that the institution of a public warning would be inadvisable, as it would increase the number of persons leaving the shelter of their homes and proceeding into the streets and fields without in any way diminishing the risks. The petition had only about 400 signatures, and I understand that the desire for a public warning is not shared by the inhabitants as a whole.

Air Raids and Telephonic Communication.

MR. WATT, on November 1st, asked the Secretary of State for War whether, in view of the frequency of aircraft attacks and the primary necessity for rapidity in transmitting information as to their movements and anticipated direction, every effort is being made by the War Office to ensure at home simplicity in telephonic transmission of this information; if codes are necessary, are they of such a nature as to be easily and quickly understood by telephonists who may not as yet have had long experience or whose education may in some cases not be of the best; and are steps taken to prevent such codes leading to errors?

Mr. Forster: The answer to the first part of the question is in the affirmative. The hon. Member will, I am sure, agree with me that no information can be given as to whether codes are or are not in use.

Insurance Against Personal Injury.

SIR E. CORNWALL asked whether insurance against injuries or loss of life due to Zeppelin raids can be effected under the Government scheme?

The Prime Minister: I am much obliged to my hon. friend for putting this question, which enables me to correct a misstatement which, owing to a misunderstanding, I made in an answer I gave him on October 18th. I then implied that it was possible to insure against injuries or loss of life under the Government scheme. This, of course, is not the case. In the opinion of the Government ample facilities already exist in the open market.

Sir E. Cornwall: Will the right hon. gentleman consider the question of appointing a small committee to inquire and report as to the desirability of making this a national liability and not a personal loss?

The Prime Minister: Yes.

Zepp.-Strafing Inventors.

MAJOR CHAPPLE, on November 2nd, asked the Minister of Munitions whether he is now in a position to publish, for the help and encouragement of inventors outside the War Office and in the hope of more adequate protection of our towns and homes, details of the vulnerable structures of Zeppelins in order to assist the inventive genius of the Anglo-Saxon race in the discovery of an incendiary missile capable of being fired from a gun mounted on an aeroplane, and having the property of bursting within the envelope of a Zeppelin and setting fire to it?

Major Baird (replying for the Air Board): I have been asked to answer this question. I would refer my hon. friend to the answer which I gave him on August 23rd, to which I can add nothing.

Ash *Longerons* in F.E. 2D Machines.

MR. TOUCHE asked the Secretary of State for War whether flying machines F.E.2D are still supplied with *longerons* for which ash has to be subsituted as soon as they are delivered to the Expeditionary Force, necessitating the dismantling of the machines and causing delay?

Major Baird: The answer is in the negative. All machines now supplied to the Expeditionary Force have ash *longerons*.

Armchair Reflections.

by the "Dreamer."

QUEER thoughts assail man's brain at times. I have just been wondering whether a man ever does anything of his own free will, or whether every action he takes, from the time he is born until the time of his departure from this life, is taken because he has to take it. It appears absurd on the face of it to suppose a man cannot, at least in most things, do as he pleases. In fact, his actions throughout his whole life appear to point to it that he does please himself. But when investigation is made, and thoughts allowed to flow, it does not seem at all so certain.

Undoubtedly a man is born because he has got to be born, undoubtedly he dies because he has got to die. Here at the beginning and end of things personal, compulsion is proved beyond doubt, it cannot be a too great stretch of the imagination to suppose that it is possible all in between is governed in the same way. I am not going to flop right into a declaration of a belief in destiny, nor to deny that man is an intelligent animal capable of guiding and governing his life in certain channels, orderly or the reverse.

Within limits, perhaps within narrower limits than we think, man performs that which is popularly known as pleasing himself, but outside those limits there is food for thought as to whether he really is pleasing himself or acting under some governing power outside his knowledge and comprehension.

I really do not know why I am writing in this strain. Certainly, when I started to write these lines I had no idea of getting on to a subject so open to controversy. I felt rather in a good humour, and quite expected to find light reading flowing from my pen, yet here I am on a subject far beyond my powers to speak intelligently upon, far away from my subject of aviation, writing without the slightest idea of where it will lead me, writing thus because I feel that I have got to. Well, let it be so. Perhaps it will lead somewhere to something interesting.

These are morning thoughts. I should have written this page yesterday, but I could not. Try as I would, I could not write yesterday. This morning at four o'clock I must get up and write. No idea of why, or what I was going to write about. No lucky striking of a subject in my dreams that I must get up and put pen to paper before it is forgotten, just simply that I must get up and write, letting words come as they are coming, writing because I have got to write.

These words will be read by people interested in aviation. People interested in aviation must read of aviation. They are possibly in aviation because they had to be. Aviation itself has perhaps come because it had to come. Had it not been for aviation, Germany might not have thought herself capable of world's conquest. Yet the very power relied upon is a factor in her undoing. And now daylight is breaking on this chill November morning. With daylight should come a better understanding between my pen and my brain, making clearer that of which I would tell. With daylight should come a better understanding between the nations on this world, who should live upon it each in enjoyment of the great life it has to offer, and not fight to the death like wild beasts.

With daylight, however, I cease to dream of a world at peace, a world in which there shall be no more fighting and killing. This is not the first war, neither shall it be the last, for so long as men are born into life, so shall they fight one with the other, nation against nation until the end of all things. Fought they always have, and fight they always will, simply because it is outside their power to do otherwise, and they have got to. Yet progress, and the march of time, whilst not able perhaps to greatly alter that which must be, may nevertheless be able by the exercise of intelligence to guide the future into certain more convenient channels.

Aviation has undoubtedly played a great part in the present war, and will most assuredly play a greater one in the next, wherever it may happen to occur. It is even possible that in aviation we have the greatest factor towards an idealistic condition of things in which war shall be an impossibility. For it is thinkable, that with aviation brought to the point of perfection it will reach in a few years' time, when all nations at the first call of war will be able to take the air in swarms, war could possibly assume quite a different aspect. So I look to aviation as one of the greatest things that matter in this and the coming time, and to this country to continue to hold that supremacy of the air which she has undoubtedly achieved at the present moment.

And with the daylight of understanding should come a closer knitting together of our own flying services, for it matters not the colour of a man's coat, whether it be blue or khaki, so that he get going at his task with a more set purpose and a better knowledge of where it leads than a "Dreamer" who must needs get up in the early morning to be led anywhere his pen happens to lead him.

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Munificent Gift from Mauritius.

ADDING to their previous splendid contributions towards the cost of the war, the Council of Government of Mauritius and the sugar planters have combined to present one million rupees to the Imperial Government to provide either 30 fighting aeroplanes, or be used as a contribution towards the cost of an airship.

ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

H. C. B. (King's Lynn).

Aeroplanes differ considerably in the way in which they take a turn, and no doubt two different pilots will handle the same machine in different ways. Some machines, notably those in which inherent lateral stability is present to a certain extent, are turned solely with the rudder, and will automatically take up the correct bank for the particular turning radius without the aid of the *ailerons*. With other machines, as for instance the Morane monoplanes, the turn is, we believe, initiated, or at any rate greatly assisted by, warping. Other machines, especially those with a low centre of gravity, may have a tendency to bank too steeply for the turn, and lateral control used to check the bank. The purpose of the spirit level on board an aeroplane is to indicate the correct bank, but as the spirit in the instrument is subject to centrifugal force it is difficult to design one which will give correct indications under all conditions. Some pilots use a short length of string for the same purpose, a relative side-wind causing the string to point slightly sideways instead of straight back. In certain respects the string may be more reliable than the spirit level, since the centrifugal force on it is negligible, but on the other hand there may be practical difficulties of fitting the string in a place where it shall be outside the slip stream of the propeller and yet be in such a position that the pilot can see whether it is pointing straight back or slightly to one side. In a very steep bank, frequently too steep for the turn, the inertia of the machine, assisted to a certain extent by the vertical side area, tends to prevent it from side-slipping downwards, although in most cases there probably is a slight drop, which is, however, so slight as to be hardly noticeable. An exception would appear to be formed by the small and very fast scouts. When Mr. Hawker did his sharp turns round the pylons at Hendon on the Sopwith scouts, he invariably side-slipped *upwards*, and it appeared that, steep as his banks were, they were not quite steep enough for the turn. It is difficult to say what is the minimum radius of turning of a small scout. They give the impression, when handled by a skilled pilot, of turning in their own length, but in reality the turning radius is probably about 100 ft. In speaking of the gliding angle of an aeroplane, the smallest angle of which the machine is capable is usually meant, the "natural" gliding angle differing with various types and being dependent on a number of things, so that no hard-and-fast rules can be laid down. The term "Oleo pneumatic" is frequently applied erroneously to undercarriages in which the landing shocks are absorbed by springs while the rebound is checked by oil contained in a small cylinder in which works a piston. The word oleo is taken from the Latin word *oleum*, which means oil. The reasons for marking the static pressure tube of a Pitot tube "Top" are probably found in practical considerations of connecting the two tubes to the indicator instrument.

E. W. W. (Coventry).

With regard to the starting system employed for the engines of a Zeppelin, it is possible that the action of the pump mentioned in our description was not, as we stated, a positive one forcing an explosive mixture into the cylinders, but started the engine, as you suggest, by drawing air from the exhaust pipes through the open exhaust and inlet valves, thus causing a partial vacuum in the cylinders and drawing a mixture up through the inlet pipes. Arrangements were certainly provided for raising all the valves, a fact which would appear to confirm your theory. In that case provision must have been made for closing up the open end of the exhaust collector or silencer, as otherwise the pump would simply draw air in through this open end instead of through the engine. At the time of inspecting the wreck we were informed that the action of the pump was as described in the article dealing with the "L.33." With regard to the spiral "something" in the right hand bottom corner of one of our photographs of the wreck, this we are not at liberty to discuss at present.

J. H. H. (Itchen).

Steel propellers are not, as far as we know, in general use in this country, and we do not know of any manufacturer turning out propellers of this description. We presume that what you have in mind is some form of propeller made up of thin steel sheeting, double surfaced to give the proper aerofoil section, and not the steel propeller of old with two flat plates for blades. Of books dealing with the theory and design of propellers we can recommend "Air Screws," by M. A. S. Riach, published at 10s. 6d. net, which we can supply post free at 10s. 11d.

F. B. (Beverley).

You might be able to pick up a good second-hand parachute for about £10. A parachute about 24 ft. in diameter would carry a man of 12½ stone. Possibly Messrs. C. G. Spencer and Sons, 46A, Highbury Grove, London, N., would be able to help you.

A. N. W. (Southampton).

When first accepted for the R.N.A.S. an officer is known as a "Probationary Flight Officer," but on being confirmed in his rank he becomes a "Flight-Sub-Lieutenant."

G. C. B. (Broadstairs).

From the brief particulars you give, it would seem that the flying boat is a F.B.A., the successor of the Donnet-Leveque system.

A. G. B. (Beckenham).

We regret that, under the Defence of the Realm Act, it is impossible to publish the particulars you desire.

W. J. C. B. (Seven Kings).

You should apply to the Officer Commanding, R.F.C. Depôt, Farnborough.

R. C. B. (North Finchley).

(1) Eighteen. (2) Director-General of Military Aeronautics, Adastral House, London, E.C. (3) By letter.

C. M. (Cork).

Get the necessary forms from the Admiralty, and after filling them up send them to the Director of Air Services, Admiralty, S.W.

S. B. A. (Hull).

There is a Cadet Corps for the R.F.C., and you should apply to Adastral House for full particulars.

Airman (Portsmouth).

The pay of an officer in the R.F.C. when training is 7*s.* 6*d.* a day. When appointed Flying Officer it is 12*s.* a day, plus 8*s.* a day flying pay. He flies as often as he is ordered to do so.

J. S. U. (Selby).

See reply to W. J. C. B. (Seven Kings).

J. H. A. (Huddersfield).

See reply to C. M. (Cork). We do not think your age would bar you.

N. W. (Newport, Mon.).

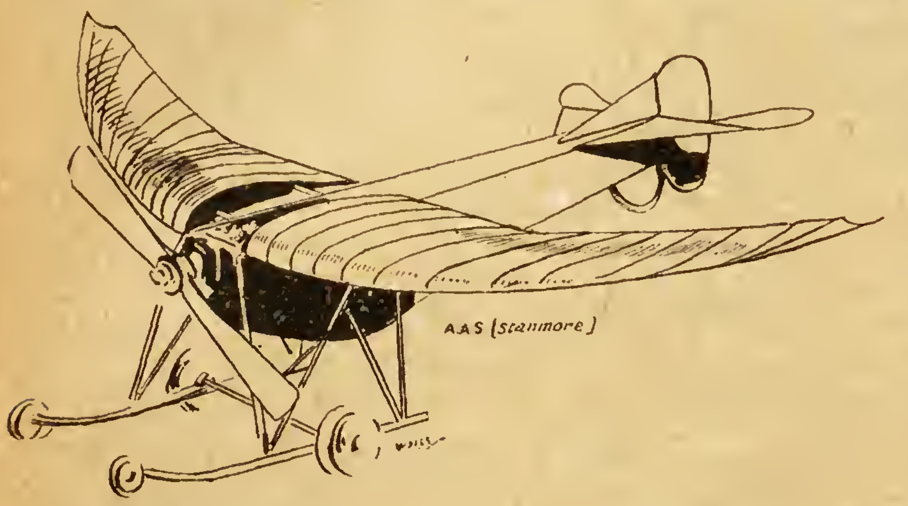
The minimum age is 18.

H. J. W. (Cradley Heath).

You would be trained at a naval flying school. Your experience should certainly help you. Get the necessary forms from the Admiralty, and after filling them up send them to the Director of Air Services, Admiralty, S.W. A Probationary Flight Officer receives 10*s.* a day and 4*s.* a day for flying risk while learning to fly; when confirmed in the rank of Flight-Sub-Lieut. he receives a further 4*s.* a day making 18*s.* 0*d.* in all.

F. S. (Yorkshire).

The possession of a pilot's certificate does not in any way guarantee a commission. For the R.N.A.S., you should apply to the Director of Air Services, Admiralty, S.W., and for the R.F.C., to the Director-General of Military Aeronautics, Adastral House, London, E.C.



A. A. S. (Stanmore).

The main planes of the Weiss monoplane were very thick at the root and tapered gradually until they were quite thin at the tips, which were, as you will see from the accompanying sketch, swept back and upturned. The tail plane was of the non-lifting type. For advantages of staggering the main planes of a biplane, see our reply to H. S. C. (Loughborough) in last week's issue.

R. S. A. (Shorncliffe).

To the best of our knowledge, the late Lieut. Warneford, V.C., was flying a Morane parasol when he brought down the Zeppelin, and it appears that the artist you mention has made a slight technical error in his otherwise wholly excellent picture of Lieut. Warneford's feat.

J. J. M. (Byfleet).

We very much regret that we are unable to furnish any particulars of the resistance of R.A.F. "streamline" wires. The results of the National Physical Laboratory tests are not now being published on account of the war. As an approximation, however, use may be made of the results of tests on various strut sections published in the National Physical Laboratory report of 1911–12, where it is stated that the resistance of a strut of elliptical section, with axes measuring 1 in. and 5 ins. respectively, was 15·2 lbs. per 100 ft., at 60 ft. per second. Assuming a fineness ratio of 5 for a "streamline" wire of $\frac{1}{8}$ in. thickness, the resistance of such a wire would be approximately 0·08 lb. per foot run, at 60 m.p.h. This figure must not be taken as representing accurately the resistance of a streamline wire, but is merely intended to give an approximate estimate.

Pay of R.F.C. Officers.

An Army Order issued on November 3rd, announces an amended scale of pay for officers of the Royal Flying Corps (Military Wing). Briefly, the new figures are as follows:—Wing commander, 38*s.* per day; depôt commander, 30*s.*; squadron commander, 25*s.*, with 8*s.* flying pay; park commander, 25*s.*; flight commander on appointment, 17*s.* (increasing by 2*s.* a day for each year of service after June 30th, 1914, to 23*s.*), with 8*s.* flying pay; flying officer on appointment, 12*s.* (increasing by 1*s.* a day for each year of service after June 30th, 1914, to 16*s.*), with 8*s.* flying pay; adjutant,* 20*s.*; quartermaster, as laid down in Articles 238–240, with extra pay of 2*s.* a day; equipment officer, 1st class, 24*s.* 6*d.*; 2nd class, 18*s.*; 3rd class, in the case of a combatant officer the ordinary rate of pay, without flying pay, provided for a flying officer, or, in the case of a quartermaster, the rate provided for a quartermaster in this Article. He shall receive, in addition, flying pay at the rate of 5*s.* a day for each day of ascent. Flying pay under Article 223 will not be issuable whilst he is under instruction on probation.; medical officer, pay and allowances of his rank, and, if required to fly, such additional emoluments as the Army Council may decide.

* An adjutant appointed before April 1st, 1916, will remain in receipt of the rate of pay laid down in the Warrant of March 26th, 1915.

The Month's Air Fighting.

A study of the *communiqués* shows that in the month of October the number of aeroplanes destroyed or damaged on the Western Front was considerably less than in September, when the total claimed by the British, French and German was well over 300. British Headquarters admit the loss of 42 machines, and claim 16 German aeroplanes destroyed and more than 23 others shot or driven down damaged. The French claim 51 brought down and 14 others forced to land. On the German side 62 Allied machines are claimed plus 5 defeated. On October 23rd it was stated that "22 enemy airmen were shot down in air fights and by anti-aircraft fire; 11 are lying behind our lines."

The American Escadrille on the Somme.

The correspondent of the *Times* with the French Army has given some details regarding the American Escadrille, which has now been shifted from Verdun to the Somme front. Since its formation in May, the squadron has accounted for 22 enemy machines—five of them having been brought down by Adjudant Raoul Lufberry—whilst they have lost two killed and three wounded. The squadron now consists of 14 American Volunteers, who use French machines, and are under the orders of French officers.

Air Work in Flanders.

From its frontier correspondents, the *Telegraaf* learns that Allied aviators, by their continuous activity, have done considerable damage to military works and depôts south of Brussels, in the neighbourhood of Hal, and between Ath and Enghein, as well as to railway communications in Hainault.

Bucharest-Salonica Air Line.

Although the Roumanian forces and the Allied Armies at Salonica are not yet in actual touch with one another, the *Idea Nationale* of Rome learns from a Russian source that Roumanian communications with Macedonia and Salonica are firmly established, thanks to the excellent air service.

A Derelict Balloon Over Norway.

It was reported from Christiania on November 3rd, that a burning balloon, supposed to be British, apparently one sent up from a warship for observation purposes, was seen on October 31st from Livter, 49 miles E.N.E. of Christiania. The balloon came from the sea, passed over the coast, and finally came down on a moor. The fate of the crew, if any, was unknown. The remains of the balloon have been brought to Farsund (50 miles west of Christiansand).

Balloon Struck by Lightning.

The special correspondent of the *Times* with the Serbian Army, reports that in the stormy weather on October 30th, one of the Serbian observation balloons was struck by lightning. The observer escaped by means of his parachute, and landed in the Serbian lines with nothing worse than a sprained ankle.

A Double Fatality.

At an inquest on Flight-Sergt. Daniels and Corpl. Luck, on November 4th, it was stated that the former was instructing the latter, on a new machine, when it crashed to the ground from a height of 80 ft. Luck was said to be piloting the machine, and Daniels tried to get hold of the control lever, but Luck would not leave go. Both men died later from their injuries, and the verdicts of "Accidental Death" were returned.

Famous French Pilot Missing.

The French flying service has lost a valuable pilot in Sergt.-Major Lenoir, who is reported missing. He has several times been mentioned in *communiqués*, and up to three weeks ago he had destroyed eleven German machines.

The Funeral of Captain Boelcke.

With full military honours the funeral service for Capt. Boelcke, whom the Kaiser has described as "my bravest and most successful air officer," was held at Cambrai Cathedral on October 31st. Among the wreaths was one inscribed, says the *Lokalanzeiger*, "From the British Officers who are prisoners of war at Osnabrück. October 28th, 1916."

In a letter, dated October 24th and published in the *Cologne Gazette*, Capt. Boelcke wrote: "Here, on the Somme, is the real airman's El Dorado. When the weather is in any way fine the whole sky is full of Englishmen."

AIRISMS FROM THE FOUR WINDS.

WITH the proof of the will of the late Mr D. H. G. Chambers, of Atherton, Sydenham Road, Croydon, at £16,955 last week, the memory of the eccentricities of a curious Surrey recluse, whose chief hobby was matters aeronautic, is revived. Most of the money goes to the erection of almshouses, but not within 50 miles of Croydon Town Hall. Bequests are made to religious societies, anti-vivisection societies and the Dogs' Home. Mr. Chambers had for many years lived quite alone at Atherton, a house of about sixteen rooms. His sister, Miss J. M. Chambers, B.Sc., after whom the almshouses are to be named, shared the house with him till her death. He had apparently left her things absolutely undisturbed, writes a correspondent of the *Morning Post.* The house was securely protected against burglars. Half-inch iron bars, firmly embedded in the masonry, were on the basement windows. The back portico had an iron gate, and every outer door had padlocks, chains, wire nets, bolts and screwed-down shutters. Moreover, the tenant kept four six-chambered revolvers handy, with ammunition. To callers the front door was only opened upon a chain. The tenant's simple fare consisted largely of patent cereal foods.

Mr. Chambers and his sister must have travelled widely. They left behind about forty trunks, hold-alls and the like including several venerable carpet bags. There were Continental time-tables, guide-books and pocket dictionaries sufficient to take the owners over the larger part of Europe. The books showed intellectual tastes. Anatomy, philosophy and physics had been studied; photography, chemistry and the uses of electricity. Aeronautics, however, seemed to have been the chief hobby. Many notes and diagrams were the work of Miss Chambers, and there was a big collection of newspaper cuttings on the subject. In a large building in the garden labour had been bestowed on all kinds of "contraptions," from big kites to small aeroplanes. The effects found there included a rotary aeroplane engine and various sets of aluminium biplane wings. Oiled calico, bundles of bamboo rods, and rolls of wire netting were among the material, with elaborately made woodwork sundries, all evidence of patient toil. A gondola-like box suggested an attempt at a man-carrying machine. At the auction these effects went at lumber prices. Miss Chambers had suffrage sympathies, and had tried literary composition. She had printed a garden

A propos of the paragraph which appeared in "Airisms" on page 883, October 12th, in regard to the ultimate effect upon the Panama Canal of the appearance of the U-boats in American waters, and the suggestion of the possibilities of aircraft assisting nature in the years to come in destroying the canal for naval purposes, a correspondent from "Somewhere in France" sends us this very suggestive sketch as a dream which he dreamt after reading the few remarks.

reverie, "The Triumph of Weeds." It is the tragedy of flowers choked by "seeding, lolling, crawling, sprawling, breeding" weeds, the authoress lamenting that "everything worthless seems to do nothing but breed."

* * *

WITH the arrival of a batch of Allied aeroplanes at Bucharest, the activities of the German airmen have suddenly ceased. With an aerial base at Rustchuk, only 40 miles from Bucharest, the enemy was able during the latter part of September and the early part of October to give the latter town little rest. Taubes twice a day and a Zeppelin at night was the daily menu. Evidently the German sportsman prefers to catch his bird sitting, rather than on the wing.

* * *

WHY all this sudden fuss in the papers about the "new" three-seater aeroplanes? Surely, there is nothing very wonderful or startling in a "gun-'bus" with accommodation for two gunners in addition to the pilot. We recollect seeing machines of this description months ago, and the disposition of crew and armament is the only common-sense one if a free field of firing in all directions is to be obtained. It is no doubt gratifying to the public generally to know that our Allies have such excellent fighting machines, but it must not be thought from the glowing accounts, that these are the last word, either on the other or on this side of the Channel.

* * *

IN an account published in an American contemporary, of the development of the Zeppelin airship, we suddenly discovered the reason for the many mishaps to airships of the "Zepp." type. The material of which the framework of the first Zeppelin was made had, it is stated in our contemporary, a tensile strength of 33 kilograms per square mètre! It must have been made of mangel-wurzels.

* * *

IT is evidently not an unmixed blessing for a neutral to be engaged in helping the Germans out with their aircraft production. Mijnheer de Waal, the Dutch pilot, who is connected with the Fokker works at Schwerin, has applied to the German Government for leave in order to go home to Holland to finish his military service. This was refused, and the German Authorities requested the Dutch Government to grant De Waal exemption, which the Dutch Government promptly refused to do. Now the German Authorities are less inclined than ever to let De Waal go back.

* * *

ONCE a *nouveau riche* in England complained about aeroplanes flying over his grounds because they frightened his pheasants. He has probably grown to have greater respect for them these times. A Colonel—and, therefore, presumably a gentleman—in Bedfordshire, under what appear to be outrageous conditions, deliberately shot the dog mascot of some troops manœuvring over his ground, because, he said, it was after his rabbits. And the punishment meted out by his brother magistrates to this "sportsman," was a 40s. fine! Wonder what it would have been had it happened to this Colonel's dog.

* * *

A REMINDER of how time passes is the *Times In Memoriam* notice of the anniversary of the death of Lieut. Edward T. Busk, who lost his life on November 5th, just two years ago. The science of aviation has had to mourn a very valuable loss against that date.

* * *

AEROPLANE building is making rapid strides in the countries of the Central Empires. Factories are multiplying at an alarming rate in both Germany and Austria-Hungary, and one of the latest to start business in a big way is at Budapest. There, with a capital of £125,000, it is stated, machines, fully equipped, will be turned out by the hundred six months hence, and even before starting, orders were in hand to keep the factory full up for a couple of years. It is about time our own Air Board policy was definitely settled to counteract such extensions as this.

* * *

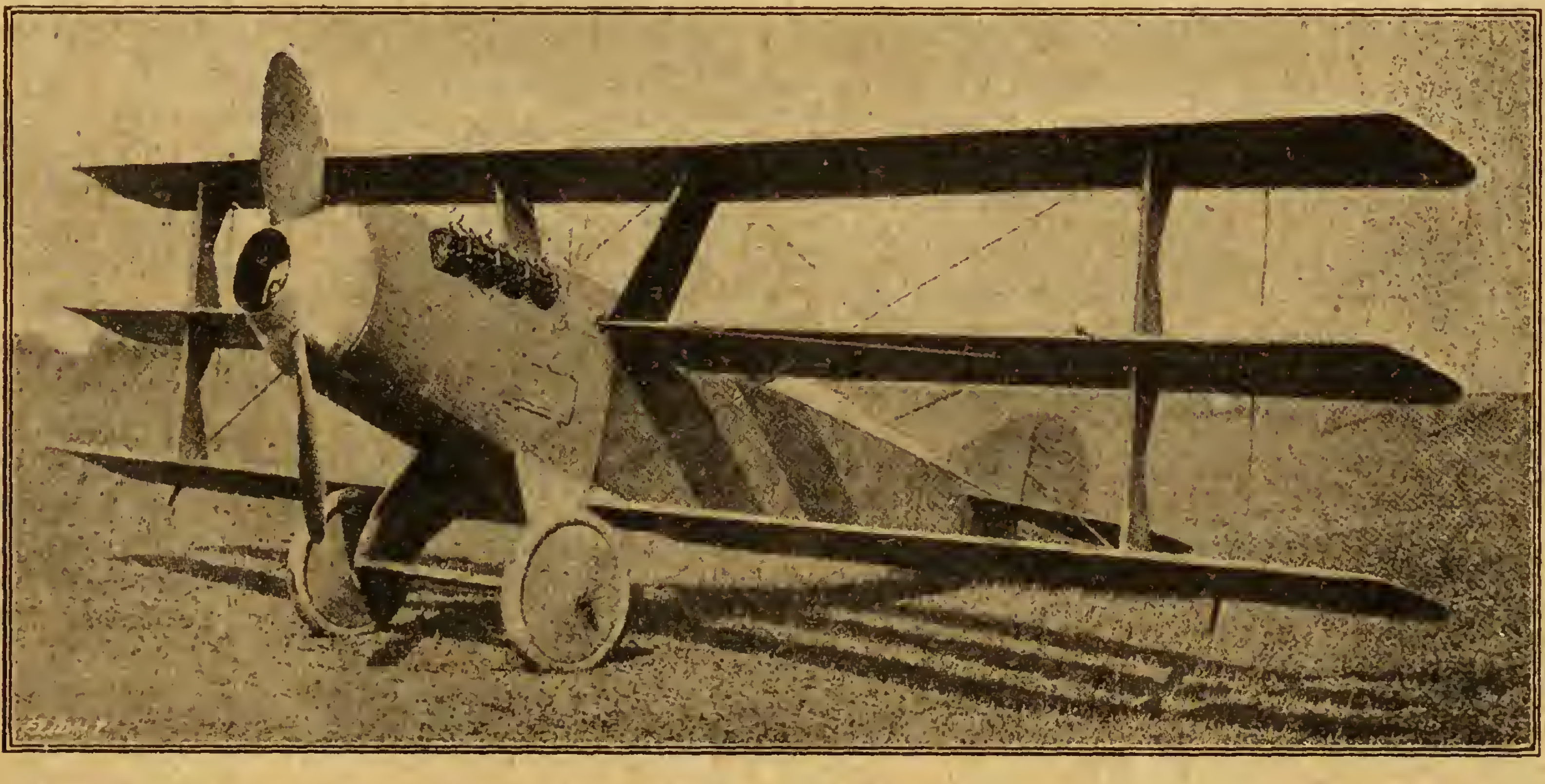
THE R.F.C. contributed the chief item at the National Sporting Club on Monday night, in the form of a fifteen-round contest between Corpl. Burrows and Air-Mechanic Watts. What win there was fell to Burrows, but the corporal punishment was hardly as much in evidence as the inclination for hugging. A better display from the R.F.C. representatives had been hoped for.

* * *

"FOUND!" Mr. W. R. Cadogan-Rothery, of 4, Hendon Park Villas, Golders' Green, writes, under date November 1st:—"I have found a cane with the crest of the Royal Flying Corps embossed on the metal cap; and beneath same, the initials of the owner. If the gentleman to whom the above belongs will communicate with me, I shall be pleased to forward the cane in question."

* * *

WHAT a revelation to the initiated would a visit to some of our munition factories be. Those who have not, so far, "sampled" this new and remarkable phase in the life of these islands, would have a great shock—although the shock would not be of the shell character, but rather one of agreeable astonishment. Side by side with girls of humble origin, girls who have all their lives been accustomed to work of a kindred character, stand women of many stages in life—some of sturdy health, others used from their birth to surroundings refined and delicate. But all the same, in the



The latest Curtiss speed scout—a triplane—four of which have been ordered by the U.S. Army. Briefly, the dimensions are: Span, 25 ft.; overall length, 18 ft.; chord, 24 ins.; gap, 28 ins.; gross weight with fuel and water, 1,060 lbs.; speed, 120 m.p.h.; climb, 10,000 ft. in 10 mins. It is fitted with a Curtiss OXX-2 motor, streamline wiring is used throughout, and the shock-absorbers are also streamlined.

munitions shop, all distinctions go by the board. Each and every one is there to help along the boys—in how many cases with the thought of one particular boy added—fighting the good cause in the trenches.

* * *

WITH an insight into the conditions of munition factory workers, therefore, it does not come as a great surprise that an appreciative factory-hand audience, and a packed one at that, can be reckoned upon to listen in rapt enjoyment at the best musical numbers, as rendered by artistes of distinction. So it comes about that down away in Kent, the special theatre which Messrs. Vickers, Ltd., have erected for the sole present purpose of relieving the monotony of the munition workers' self-imposed task, is the scene of many an entertainment that would draw a big paying audience at Queen's Hall. The directors of the firm have thought with generosity in supplying this great safety-valve against the strain of the war work going on, and last week the Vickers' employees, or as many as could be gotten into the theatre, had a special treat, in being able to listen to a delightful recital by the Russian pianist, M. Sapelinikoff.

* * *

THE occasion was the more interesting as, by reason, no doubt, of Vickers' vast business connection with Russia, a party from the Russian Embassy was present in the balcony, whilst a presentation of a gold cigarette case to the Russian pianist by Count Ostrorog, a director of Vickers, Ltd., formed an agreeable interlude in the programme. M. Sapelinikoff's interpretation of the Russian and French pieces which he selected was not only appreciated by his mixed audience, but appeared to be thoroughly understood, so judiciously chosen has been the fare provided at the little theatre. Altogether a very happy evening, varied by some songs from Miss Gladys Moger, the permanent pianist of the theatre, Miss Walker sympathetically accompanying the singer.

* * *

A propos of Russia, the latest claimant to be the original inventor of the "Tanks" is a native of that country, A. Porokhovtchikoff by name. But as the plans of his "land Dreadnought" were not submitted to the Russian Government until August, 1915, he would appear to be about on a par with some of the claimants this side of the water. After the documents recently circulated by Mr. Macfie upon the subject, it will be interesting to see what some of the other suggestors of these fearsome beasts have to say in reply.

* * *

STATE responsibility for aircraft damage is once more to the fore. We have little hope of any reversal of the policy hitherto in force, although a sop has been thrown by the recent consent of the Prime Minister to hear arguments upon the subject of loss of life from Zepp. raids. On the property insurance point Mr. Asquith has again refused to be interviewed.

* * *

THAT much appreciated "stoggy" bread of Winters, Ltd., referred to a week or two back in Capt. Challoner's letter from his Bavarian prisoner-of-war camp, does not after all appear to be so good by reason of its being a "home-made" article. We learn from Messrs. R. Winter, Ltd., of Birmingham, the makers, that it is a much rarer vintage than that. In fact, they have sent us a sample, and we must confess ourselves more than pleased with its qualities, and we are not surprised at it being sought after by our unfortunate men at present in durance vile in the land of the Huns. Mr. Winter points out that the firm's bread is of quite a unique character, being a highly malted food, which has the property of keeping for a very long time under any reasonable conditions.

A SPANISH VIEW ON OURSELVES.—"Opening of the hunting season."
(*Campana de Gracia, Barcelona.*)

* * *

OH! those Zepps. A solicitor, defending a client summoned upon a charge of milk adulteration recently, put up the novel defence that the cow that yielded the milk had been affected by a Zeppelin raid to such an extent that her milk had secreted a smaller proportion of solids than usual

* * *

IN commenting upon this pump story, the writer of "A Londoner's Diary" in the *Evening Standard* holds forth as follows:—

"This defence was derided at the time; but there was something in it. I have learned from a medical friend that in a certain suburb of London, after a raid, the local medical men noted seven cases of women with infants at breast who had been so terrified that they could no longer suckle their offspring, because their milk had largely turned to water under the influence of their fright. This physiological fact may be set to the credit of some suspect milk dealers, but it would not be wise for them to build too much on it."

* * *

We endorse the advice given in the last paragraph. The London magistrate is a contrary creature, anyway.

* * *

LORD BERESFORD is of the "ton to ton" shipping brigade. Speaking at Edinburgh the other day, he said he was anxious about the enemy's submarine campaign, and advocated that we should tell the enemy that they would have to pay one ship or two for every one sunk if they went on with their campaign, and, if need be, we would take their whole mercantile marine. Hear, hear!

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT'S" *precursor and sister Journal) of November 3rd*, 1906. "FLIGHT" *was founded in* 1908.

M. SANTOS DUMONT'S FLYING EXPLOIT.

After two attempts in the morning, in which M. Dumont was apparently not satisfied with the speed attained on the ground, he went out again in the afternoon of October 23rd (after effecting a slight repair) at about half-past four. Then, after getting up a good speed on the ground, he slightly tilted the forward tail of the machine upwards, and without a hitch of any kind soared gradually upwards to about 5 metres above the earth, and maintained that elevation for a little over 60 metres at a speed of about 40 kilometres per hour, when, becoming nervous (and no wonder), he cut off the ignition, and the machine sank gradually without any particular suddenness to the ground. . . . It is satisfactory to learn that M. Santos Dumont has himself become converted to the necessity of employing rudders behind, and we understand that his machine when it next appears will probably be equipped with one or more. When asked how he proposes to manipulate them, he declared, possibly in fun, that as his hands would be occupied in managing the vertical tail, he intended to tie a string round his neck to work the rearward rudder.

THE ARCHDEACON CUP OFFICIALLY AWARDED TO M. SANTOS DUMONT.

At their sitting of October 26th, the Commission d'Aviation of the Aero Club of France decided that although it was impossible to measure the actual distance flown by M. Santos Dumont on the 23rd of the month, that it was clearly more than 25 metres, and they accordingly allotted to him the Archdeacon Cup. They also heartily congratulated M. Santos Dumont on his exploit, and have arranged to give him a banquet on the 10th of November.

THE NEW MILITARY AIRSHIP SCHOOL.

The celebrated 1905 Lebaudy airship has been taken back to Moisson, and is to be there employed for training the members of the Army Aeronautical Department in their various duties, to form in fact, the centre of a military aeronautical school, which will be under the supervision of Commandant Boutticaux and Captains Voyer and Bois.

LEBAUDY, 1906.

The 1906 Lebaudy airship, which has been ordered by the French War Office from Messrs. Paul and Pierre Lebaudy, is nearly ready for delivery. The gas-vessel is 60 metres in length, and the diameter at the thickest part is 10·3 metres, the capacity being 3,150 cubic metres. The power of the motor has been increased, the new airship being provided with a 70 h.p. Panhard-Levassor motor, thus giving an increased power over its predecessor of some 20 h.p., so that it is anticipated that both the speed and radius of action of the new airship will be a good deal greater than that of the machine it is replacing.

THE ZEPPELIN AIRSHIP.

Count Zeppelin is so satisfied with the reliability of his present airship that he contemplates making an extended circular tour from Manzell, on the Lake of Constance, to Stuttgart, returning over the Black Forest to Basle and Zurich, and thence back to the starting point. This will be a journey of, roughly speaking, 250 miles, and if successfully accomplished it will certainly show that the Zeppelin airship is all that its admirers claim it to be.

* * *

UNDER *the above heading will be published weekly particulars of a personal character relating to those who have fallen or have been wounded in the country's service, announcements of marriage and other items concerning members of the Flying Services and others well known in the world of aviation. We shall be pleased to receive for publication properly authenticated particulars suitable for this column.*

Casualties.

Second Lieutenant CUTHBERT JOHN CREERY, R.F.C. (who was killed in an air fight on October 20th), was second son of Mr. Andrew McCreight Creery and of Mrs. Creery, of Vancouver. He was twenty-one years of age, and received his commission in December, 1915, while he was gazetted flying officer in April last.

Lieutenant J. CEDRIC JERVIS, R.F.C., who was killed on October 26th, aged 26, was the son of the Rev. J. Jervis, vicar of Snitterfield, Stratford-on-Avon. He was educated at King Edward's School, Birmingham, and was preparing for Holy Orders at the Scholæ Cancellarii, Lincoln, when the war broke out. He was one of four brothers who offered their services (one is now a prisoner in Turkey). He enlisted in the Royal Fusiliers Public Schools Battalion, in which he obtained his commission, and transferred to the Royal Flying Corps.

Captain LAWRENCE HOPE KING-HARMAN, Royal Horse Artillery, attached R.F.C. (killed on active service), was the elder son of Sir Charles and Lady King-Harman and grandson of General Sir Robert Biddulph, G.C.B., G.C.M.G. Born in 1889, he was educated at Bradfield College and the Royal Military Academy, Woolwich. He obtained his commission in the Field Artillery in July, 1909, and joined his battery in India. In June, 1915, he was selected for the Royal Horse Artillery, and took part in the Mohmand Expedition on the North-West Frontier, for gallant conduct in which he was mentioned in despatches. Early in this year he responded to a call for volunteers for training as observers in the Royal Flying Corps in India, and proceeded to Mesopotamia in June last, attached to that branch of the Service. On arrival at the front he was placed in temporary command of a field battery, and rejoined the R.F.C. shortly before his death. He was killed in an accident while flying on October 26th.

Second Lieutenant ROBERT SHIRLEY OSMASTON, M.C., Royal Sussex Regiment and R.F.C., was the son of Mr. and Mrs. Francis P. Osmaston, of Stoneshill, Limpsfield, and grandson of Mr. John Osmaston, late of Osmaston Manor, Derby. He was born in 1894, and educated at Earleywood Preparatory School, Ascot, and Winchester College (Kingsgate House), where he gained the gold medal for gymnastics in 1912, and was an excellent boxer. He had a short course of agricultural training after leaving Winchester, and when the war broke out enlisted as a private in the U.P.S. Brigade. In May, 1915, he obtained his commission in the Royal Sussex Regiment, and went to the front on December 1st, 1915. Early this year he was an instructor of Lewis gun training and later acting adjutant of his brigade, and was attached to Brigade Headquarters learning staff work. In April he conducted a raid into the enemy trenches very successfully and without any casualties, and was shortly afterwards awarded the Military Cross. In July he transferred to the R.F.C. and served as observer till he was killed.

WILLIAM BELL SAINT, Second Lieutenant, Royal Scots, attached R.F.C., who has been killed, was the younger son of Mr. and Mrs. H. B. Saint, Selborne, Monkseaton, and was aged 23. Lieutenant Saint joined a public school battalion in September, 1914, and eight months later obtained a commission in the Royal Scots. In January of this year he was attached to the Flying Corps as an observer, and he went to the front in May.

Lieutenant JAMES ALEXANDER SIMPSON, R.F.C., who has died of wounds, was the eldest son of Mr. James Simpson, bank agent, Portree. He returned from the Malay Peninsula soon after the outbreak of war, and received a commission in the Black Watch, afterwards joining the Flying Corps. Lieutenant Simpson was educated at Portree and Aberdeen Grammar School, and was several years on the staff of the Meteorological Observatory, Cape Town. He subsequently held a similar appointment in the Malay Peninsula.

Second Lieutenant FRANCIS GEORGE STUART WATSON, Lancashire Fusiliers, killed on October 27th, was the only son of Mr. Alexander Watson, architect, and Mrs. Watson, of Villa Languard, Torquay. He entered Sandhurst in August, 1915, and received his commission on January 26th last. After taking a three months' course of flying with the R.F.C., he joined his regiment and went to the front on June 15th. He was 19 years of age.

Lieutenant SYDNEY HAYWOOD, R.F.C., who was on October 26th killed as the result of an aeroplane accident on active service, was the elder son of Charles and Ethel Haywood, "Greycroft," Accrington. His age was 25.

Married and to be Married.

The marriage between Captain H. ERIC DIXON, Middlesex Regiment and R.F.C., and Miss MURIEL A. SEYMOUR METFORD will take place quietly on November 18th at 2.30 p.m. at Christ Church, Lancaster Gate, W.

The engagement is announced between RICHARD HILTON, Lieutenant, R.G.A. and R.F.C., second son of Mr. J. E. Hilton, of Lambourne, Berks, and PHYLLIS MARTHA, eldest daughter of the Rev. and Mrs. STANLEY H. WOODIN, of Yarmouth Rectory, Isle of Wight.

NEVILLE B. MANSON, Lieutenant, London Regiment, attached R.F.C., was on Wednesday married to Miss MAUD TALBOT, at All Saints' Parish Church, Hove.

The engagement is announced of TANNER M. ROGERS, Lieutenant, General List, attached Aeronautical Directorate, only son of Mr. and Mrs. Montagu Rogers, of Nansloe, Helston, Cornwall, and RACHEL FRANCES, second daughter of Mr. and Mrs. KEVITT ROTHERHAM, Great Gatehouse, Kenilworth.

Items.

The Rev. WM. AITKEN HASLAM, who joined the R.F.C., is well known in South London. He is a son of the late Rev. J. W. Haslam, vicar of the Peek Memorial Church, St. Saviour's, Denmark Park. Previous to his ordination, Mr. Haslam was attached to St. Saviour's. His first curacy was in Lewisham, and he afterwards served at Epsom, Battersea, Wandsworth Common, and Long Ditton.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *War Office, October 31st.*

"*Salonica.*—Our naval aeroplanes dropped bombs on the railway bridge at Simsirli (east of Drama), and damaged it."

General Headquarters, November 1st, 9.12 p.m.

"Yesterday our aircraft did some useful work in reconnaissance and in bombing enemy batteries. One hostile machine was driven down in a damaged condition, and one of ours is missing."

General Headquarters, November 2nd, 9.10 p.m.

"A number of enemy batteries were bombed yesterday by our aircraft. One hostile machine was driven down damaged, and one of our own machines is missing."

War Office, November 2nd.

"*Salonica* (*Doiran Front*).—Janes Station was bombed yesterday by hostile aircraft, but no damage was incurred."

General Headquarters, November 3rd, 9.32 p.m.

"Yesterday, in the course of combats in the air, two enemy machines were destroyed."

War Office, November 3rd.

"*Salonica* (*Struma Front*).—Bursuk has been successfully bombed by our airmen."

"*Mesopotamia.*—On November 1st a hostile aeroplane was bombed and destroyed by one of our machines."

General Headquarters, November 4th, 9.12 *p.m.*

"Yesterday our aircraft successfully bombed many enemy billets. One of our machines attacked and destroyed a hostile aeroplane, but was in turn attacked and fell inside the enemy lines. Four others have failed to return. The strong westerly winds of the past three weeks have made our aerial operations difficult, since they drift our machines far over the enemy front, and compel them to return slowly against a head wind."

General Headquarters, November 6th, 9.39 *p.m.*

"Yesterday, in spite of the gale, our aircraft did useful work in observing for the artillery. One machine was in the air for over three hours."

French. *Paris, October 31st.*

"*Balkans.*—British aircraft bombarded important enemy depôts at Demir Hissar."

Paris, November 1st.

"On the Somme front yesterday two German aeroplanes were brought down by our pilots in the course of aerial fights."

Paris, November 2nd.

"In spite of the mist and the gales which have prevailed on the greater portion of the front, our chaser-planes displayed activity yesterday. On the Somme Warrant Officer Tarascon brought down his seventh enemy machine, in the direction of Moislains. One of our three-seater aeroplanes brought down on the same day two German machines, which fell one in the aerodrome of Metz-en-Couture and the other at Mont St. Quentin. In the region of Verdun a German machine was brought down near Hogneuville-en-Woevre by Warrant Officer Sayaret. This is the sixth machine brought down until now by this pilot. One of our attacking squadrons attacked with machine-guns an infantry column of the enemy in the direction of Azannes and some trains in the region of Conflans and Mangiennes. Finally, in Alsace, one of our pilots attacked four German machines, and brought down one, which came crashing to the ground near Altkirch."

Paris, November 3rd.

"On the Somme front one of our three-seater aeroplanes which was attacked in the region of Hallaines by a group of six enemy machines succeeded in bringing down one. One of our chasing squadrons which had come without delay to the help of our machine brought down a second enemy aeroplane and forced the others to take to flight. A German machine, struck by a shell from our anti-aircraft guns, fell in the forest of Nonnepruck (west of Mulhouse)."

Paris, November 4th.

"During yesterday, on the Somme front, Lieutenant Heurtaux brought down his eleventh enemy machine near Rocquigny, and Sergeant Sauvage his sixth. The latter fell near Mesnil-en-Arronaise. A third German aeroplane was brought down in the district of Mesnil-Bruntel by one of our pilots."

"*Balkans.*—One of our aeroplane squadrons bombarded the enemy encampments north of Monastir and near Prilep."

Paris, November 6th.

"British aeroplanes dropped several bombs on Bogdantzi."

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SIDE-WINDS.

Big trees from little acorns grow, is an old saying, and there are several illustrations of it in connection with the aviation industry. Last Saturday the Fellows Magneto Co., Ltd., called together their friends to help in the formal opening of their new works at Cumberland Avenue, Park Royal, and although the factory as it stands at present is of no mean size, it was divulged that the extensions which are now going up will increase it by some 250 per cent.! That is an achievement of distinction, and no wonder Mr. Douglas Fellows and all associated with him were in great form in displaying not only the new factory, but also the splendid magnetos which are now being turned out and creating such a demand, that it is a case of "all hands to the pump" to keep up the pace. After the visitors had been shown round the shops, there were light refreshments and music, and during an interval Mr. Alleyn, Mr. Fellows' co-director, made a most stirring speech, in which he emphasised how necessary it was, if we were to win the trade war, for investors who had hitherto been content to rely upon gilt-edged securities to come forward and encourage commercial enterprises which had shown themselves worthy of support or gave promise of being developed into successful business concerns. Mr. Alleyn also expressed appreciation of the co-operation of all the workers in building up the concern which only a year or two ago was a repair shop for magnetos. Mr. Alleyn also indicated that the firm are not trammelled by any old-fashioned ideas, and indicated that, successful as the firm had been, there was no intention of resting on their oars. Altogether it is a case of "keep your eye on Fellows," of Magneto fame.

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Congratulations to Mr. Herbert Austin, the founder and indefatigable Managing-Director of the Austin Motor Co., Ltd., who attained his fiftieth year on Wednesday last.

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Changes and improvements in the Curtiss 160 h.p. VX motor, which, it will be remembered, has eight cylinders, 5-in. bore by 7-in. stroke, have led to such an increase in the power output, that it will in future be designated 200 h.p., and the new series will be styled VX-3. One of these motors in a recent one hour's test averaged 210·26 h.p., with a gasoline consumption of ·528 lb. per h.p. hour, while the oil consumption was ·844 U.S. gal. per hour.

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MR. H. WHITE-SMITH, of the British and Colonial Aeroplane Co., Ltd., has been appointed the representative of the Society of Motor Manufacturers and Traders on the Sub-Committee for Research on Aircraft Steels.

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SUNDRY references which have been made in these columns from time to time to the wonderful results of the Barimar scientific welding process in dealing with seemingly hopeless smashes, have led to sheaves of inquiries from all parts of the kingdom. Many of the inquirers, in their desire to assist Messrs. Barimar, in quoting send along rough sketches of the parts which require repairing, but the firm point out that although in ninety-nine cases out of a hundred successful repairs can be made, it is impossible to quote prices for such work with any degree of accuracy from such sketches. The quickest and best plan is to send the fractured part, carriage paid, to Barimar, Ltd., 10, Poland Street, Oxford Street, London. Expert opinion with price and date of delivery, will be sent by return post. Will readers kindly note?

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THE last formal function to be held during the Mayoralty of Sir Charles Wakefield took place on October 31st in the form of a luncheon given to the Mayors of the London boroughs. Among the guests were Mr. Harry Hawker, to whom the Lord Mayor presented a handsome gold medal in commemoration of the plucky performance under difficulties which he gave before a party of a thousand wounded soldiers at the Karsino, Hampton Court, on August 12th last. Gold medals were also presented by the Lord Mayor to Squadron Commander R. D. F. Paul "in recognition of his valued assistance," and to Platoon Commander A. J. Wilson "with full recognition of his great organising abilities," these two officers of the London Volunteer Rifles having organised the general and transport arrangements respectively. Mr. Carl Hentschel, Secretary of the London Volunteer Rifles, who organised the concert programme, and Mr. Frank Fisher, who acted as Master of Ceremonies, on behalf of the Lord Mayor, received similar presentations.

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THE November monthly stock list of Aircraft Supplies, Ltd., is to hand, and is full of good things, as usual. One interesting item is a reproduction of a certificate recently obtained in connection with a test of 4 × 44 Binet type strainer, which sustained an ultimate load of 45·7 tons per square inch of body of the eyebolt, while one of the steel eyebolts was bent over double without cracking. By the way, the firm are now in a position to supply ribs, spars, and other wood parts in large quantities for aircraft of R.A.F. or private design, and they also offer quick deliveries. Arrangements have also been completed for the supply of metal fittings and timber for Bessoneau collapsible hangars.

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THOSE who are patiently, or impatiently, expecting the new list of standard A.G.S. parts, which is being got out by Aircraft Supplies, Ltd., will have to wait a few days longer. In order to make the book even more complete than was originally intended, the publication has been held up, but it is expected that it will be out early next week. The list will include all the most important items in what are known as R.A.F. aeroplane general supplies, and each part will be illustrated by reproductions of actual photographs and blue prints. Specifications, fits and limits, complete dimensions and R.A.F. material specifications of all mark numbers will also be given. As it should prove invaluable for reference purposes, every firm in the industry should make certain that their name is down to receive a copy. All that is necessary is to send an application to the Secretary, Aircraft Supplies, Ltd., 17, John Street, Theobald's Road, London, W.C., or 166, Piccadilly, W. Do it now.

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MODELLISTS should note that Messrs. T. W. K. Clarke and Co., Ltd., of 29–33, High Street, Hampton Wick, Middlesex, are still able to supply models and accessories, but owing to abnormal conditions there is a little difficulty in obtaining some materials, such as aluminium. This may entail taking a little longer than usual in executing some orders, and the indulgence of customers is therefore requested should there be any unavoidable delay in this way.

COMPANY MATTERS.

NEW ISSUE.

Fellows Magneto Co., Ltd.

THE prospectus is issued this week of this Company offering for subscription £50,000 8 per cent. cumulative preferred shares, which, with a capital of £75,000 in 50,000 preferred shares of £1 each and 50,000 ordinary shares of 10s. each, was formed to take over as a going concern, as from July 1st, 1916, the business of Messrs. Fellows and Co., magneto manufacturers and repairers, of 99–103, Horseferry Road, Westminster, and of Willesden. The preferred shares are entitled, in addition to the 8 per cent. cumulative dividend, to 20 per cent. of the net profits which it is decided to distribute as dividends in each year after payment of 8 per cent. on the preferred. The prospectus states that the Company has Government orders in hand to the value of £22,443, and the War Office has notified its preparation to give the Company a running order for 400 magnetos per month and spare parts. The Company values this order at about £84,000 per annum. A large increase in the output is being arranged; additional machinery to the value of £10,000 is being laid down and a new factory is being extended at a cost of £5,000. The net profits of the business of Fellows and Co. for the year ended June 30th last are certified to have amounted to £3,482, excluding partners' drawings but including cost of experimental work, on a capital of less than £8,000. The purchase price paid to the vendors was £20,000 in 40,000 fully-paid ordinary shares and £1,000 in cash, and an option was given them to subscribe for the 10,000 unissued ordinary shares at par at any time during five years from June 30th, 1916. The Treasury has intimated that it raises no objection to this issue, and the Company has every indication of a good industrial investment.

THE directors of Brown Brothers, Ltd., have declared an interim dividend of 2½ per cent., free of tax, on the ordinary shares in respect of the profits for the year 1916.

NEW COMPANIES REGISTERED.

GLENDOWER AIRCRAFT CO., LTD., 3, Glendower Place, South Kensington, S.W.—Capital £3,000, in £1 shares.

R. G. PAGET AND SON, LTD.—Capital £5,000, in £1 shares. Acquiring business of a maker of aeronautical shed covers, tents, &c., carried on by J. C. Paget, at 49 and 50, Aldersgate Street, 21, Albion Road, and 36, Newington Green, all in London, as "R. G. Paget and Son." First directors: J. C. Paget, T. W. Nickalls, H. O. Wells, and C. E. White.

R. G. TOMS AVIATION AND MOTOR CO., LTD.—Capital £2,000, in £1 shares (1,000 preference). Acquiring the business of R. G. Toms, manufacturers of aeroplanes, airships, &c. First directors: R. G. Toms, J. Hopper and C. F. Hemingway.

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FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

STRAIGHTS last week with instructor: Messrs. Balden, Child, Flynn and Kent. Circuits and landings with instructor: Messrs. Green, Hitchcock, Kaizer, Munro, Norris, Ranson, Robertson, Rogers, Sutherland, Travers, Whiteman and Wood, Circuits alone: Lieutenant Steeves.

Instructors: Messrs. Manton, Winter, Pashley, Biard, and Hale.

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

Order "FLIGHT" to be either delivered or reserved for you regularly.

As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

An Imperial Air Fleet.

ONE cardinal result of the war was foreshadowed the other night by Sir Joseph Ward, the High Commissioner for New Zealand, at a meeting of the Imperial Air Fleet Committee. Speaking on the problem of the air generally, he said that while, undoubtedly, a tremendous advance had been made in our air work, we were still only on the threshold of this field of defence. As much would have to be done for the defence of the British Isles in the air as has been done on the sea. In all human probability aerial work would become a more effective branch of the fighting service—both as a means of destruction and protection—than either the Navy or Army. Other countries were sure to develop it, and we could not afford to stop organising and expanding a service which the war had proved to be an indispensable necessity. Every part of the Empire must do its part in the task of aerial defence. In the matter of defence, he was more than ever impressed with the necessity for responsible men in this country visiting the Overseas to acquire a first-hand idea of defence needs.

We are in absolute agreement with the views expressed by the distinguished speaker. In one respect we go farther, since we would eliminate the qualification he made as to the future importance of the Air Service, and say that with absolute certainty it will become a more important branch of the machinery of offence and defence than either Army or Navy. The prophet has no honour in his own country, we know, and in spite of the accuracy with which those who had either knowledge or imagination predicted the part that aircraft would play in the present war, there are doubtless many who would join issue on this question of the future of aerial war. Equally is it the case that some of those who would thus contest the accuracy of the forecast are those who were responsible for our state of unpreparedness when we entered the present struggle, and who, presumably, will have a good deal to say on matters affecting policy after the war. That is, unless the nation decides—as it may—to make a clean sweep of the ostrich-like "statesmen" who refused to heed the writing that was plain enough for them to have read.

It is the more welcome, therefore, to know that the Dominions beyond the seas are alive to the future, and, what is even more to the good, are determined to have the say in Imperial policy that, Heaven knows, they have earned. The future of the Empire is literally in the air. We do not expect this to meet with instant recognition from the constituted authorities of the Motherland. It would be flying in the face of all the lessons of the past to expect it. It is here that the virile common-sense of the younger nations of the Empire will help forward the ideal of air supremacy and assist in forcing the policy of the Imperial Government. If they accept, as we believe they will, the principle that to preserve our Empire intact we must adopt the true principles of a real Imperial defence, a necessary part of which is the proposition of absolute aerial supremacy secured through an Imperial Air Fleet, we are confident that with the assistance of the very strong volume of opinion that is growing up in Great Britain, the end will be achieved.

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Prepare for 1917!

Writing from the Somme front, Mr. Ashmead-Bartlett says that :—"What we want now is patience, more armies for the spring, more guns and still more ammunition. The enemy hopes to save himself by the substitution of a higher percentage of steel and high explosives for the human flesh which he can no longer replace. If he does this, we must do the same, and not only maintain but increase the superiority in guns and material which we have enjoyed this summer and autumn on the Somme. Then, next time, with the enormous numerical superiority in men we shall possess, with new armies that have not been exhausted by a winter in the trenches, we ought to obtain that final victory for which all so ardently long."

That is the end for which the Empire must strive and strive again, so that the advent of the spring of 1917 may find us with an overwhelming superiority in everything that makes for success in war. More men, more guns, more ammunition and more air squadrons to do their part in ridding the soil of the Allied countries from the foul plague that has infested them for more than two years. And not only more aircraft to maintain our present supremacy, but more aircraft to make that supremacy absolute and unchallengeable. That it will be challenged we are assured. The enemy will strain every manufacturing resource during the coming winter to regain in the spring what has passed out of his hand, we hope and believe for all time. But there must be no slackening of effort on our own part. On the contrary, now more than ever is the time for us to concentrate our fullest efforts on the problem of aerial supremacy, not only to the end of accelerating production, but on improvement and yet further improvement in material. The Germans, we are told, are busy on new types of machines which are the result of the experience gained in recent aerial war. It behoves us, therefore, not to complacently assume that because we are superior for the moment there remains nothing to be done to improve our material. We do not suggest that we are doing nothing to advance, but we have had one mild surprise sprung on us in the shape of the much-engined Fokker. True, the effect did not last long, and we were able to counter it very effectually, but the fact remains that for some period of time our own battle-planes were outclassed by those of the enemy. That must not happen again. We have gained ascendancy in the air and we must keep it, or the nation will be satisfied with nothing less than the heads of those who are responsible.

The note of warning we have sounded is not uncalled for in the light of the continuous insistence of the war correspondents on the ascendancy of our airmen over the enemy. One communication that lies before us begins :—"In aviation the Bosches have ceased to exist. That is the unanimous verdict of military experts." We should be inclined to call it pernicious piffle. In the same issue of the journal in which this was printed we find a long descriptive account of the air battle of the 9th, in which 30 of our machines were engaged by a German air force estimated at from 36 to 40 machines! Farther on we find it stated that the German airmen are straining every nerve to recover some of their lost prestige, and are copying our tactics by even flying low and using their machine-guns on troops and convoys. Again, we are told that there has been shown a tendency to greater enterprise in bombing railway centres and ammunition stores in rear of the Allied lines. Yet we are asked to believe that in the air "the Bosche has ceased to exist." On the contrary, we believe the Bosche is very much alive. He has been scotched by our own aerial activities, but he certainly has not been killed. We do not like to see so much about Allied air ascendancy, when it strikes the wrong note like this. Naturally, we regard it as one of the portents of ultimate victory that we have attained to the strong position in the air that we have, but we deprecate strongly the sort of writing that is calculated to lull us into a false sense of security. Depend upon it, as we have already said, the enemy will make—is making—tremendous efforts to regain his lost command of the air. We shall not retain it by talking as though there were no further need for effort. That way lies disaster.

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A Real Battle in the Clouds.

It is a thrilling story, that of the battle in the clouds which was told in the newspapers on Monday. Seventy machines, more or less, took part in it, and the story reads more like a page from Wells' "War in the Air" than the sober record of an actual happening. The *Times'* account of the battle, which is a graphic picture of this historical air-fight, we reprint in this issue; an epic story indeed, with a moral all its own. So long as we equip our magnificent flying service with material that is equal to, or better than, that of the enemy, and in sufficient quantity, so long will the story of the war in the air be written the same.

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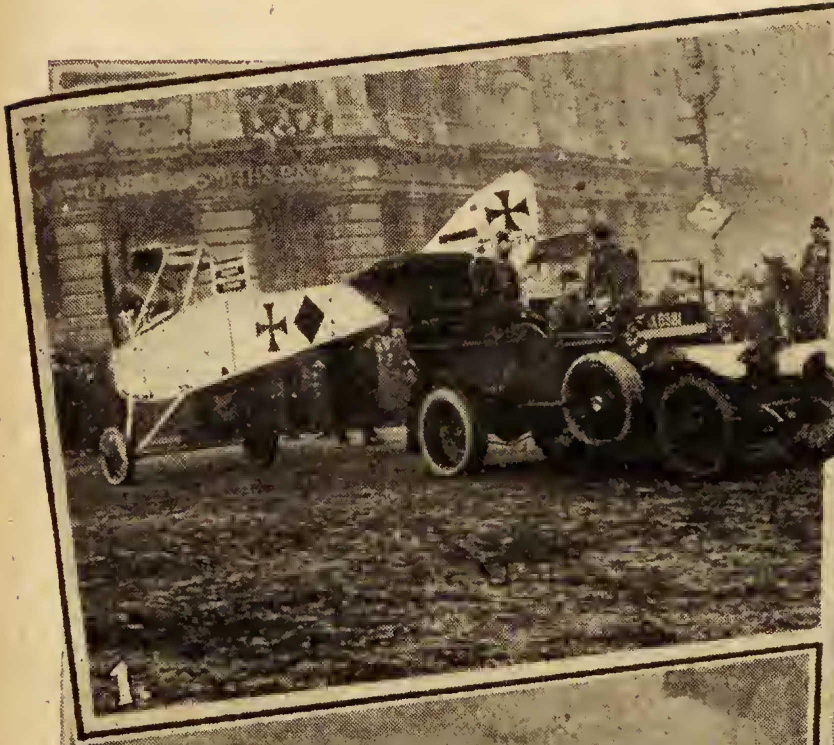
The Insurance Ramp.

Rather more than a year ago—in our issue of October 8th, 1915, to be exact—we discussed the position of landlord and tenant in relation to the insurance of buildings against risk from enemy aircraft. The particular question at issue was, with whom rests the liability to insure against damage done to buildings as a result of air raids? The crux of the whole



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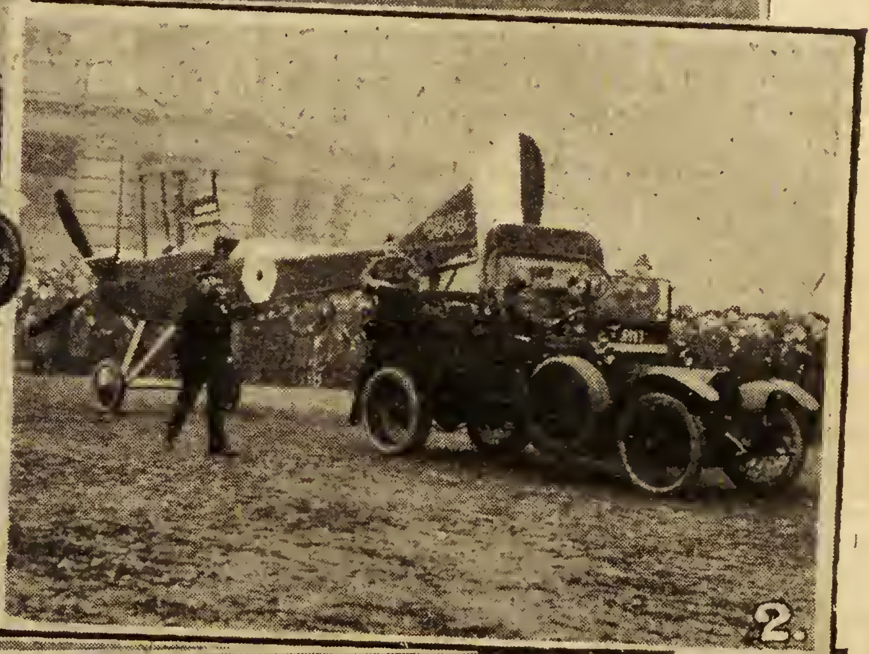

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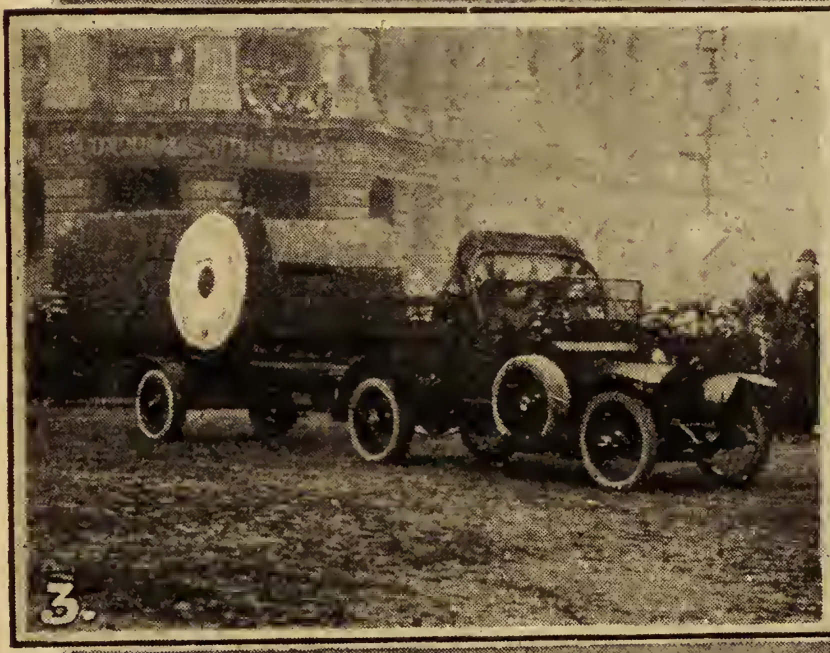

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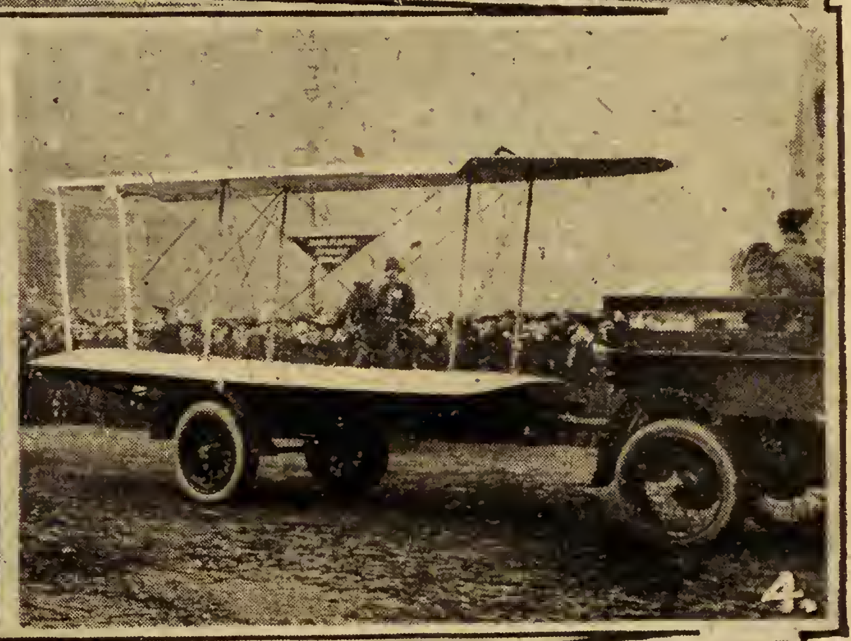

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Some snaps of the Lord Mayor's Procession, placed in rotation as they appeared.—1. *Fuselage* of captured German L.V.G. 2. *Fuselage* of British B.E. 3. Port-side wings of British B.E. 4. Wing of a captured German aeroplane. 5. Military firemen, who help to look after Zepp. damage. 6. A captured German field gun.

question is contained in the point raised by a quotation we then gave, and which is as follows :—

> "It seems desirable that lessees should be warned against relying for protection against damage upon insurances effected in the name only of the landlord.
>
> "The popular, and perhaps the common-sense, view is that it is the house that is insured by the policy; but in law a policy is simply a contract of indemnity, *i.e.*, to indemnify the person against loss. If, therefore, the lessee's covenants in the lease cover the making good of damage caused by aircraft, then it appears that in law the ultimate burden of making good the damage would fall on the lessee, in spite of the policy.
>
> "Lessees, therefore, at any rate where the lease contains wide repairing covenants, should see either that any policy effected by the landlord is placed in the name of the lessee as well as that of the landlord, or should effect a separate insurance in their own names."

The whole matter has been raised again by an action heard in the Court of Chancery last week. The facts of the case were briefly these. A Miss Roberts, having a 60 years' lease of certain factory premises, sublet them to a second party, who in turn assigned them to a third. Serious damage was done to the premises by an incendiary bomb dropped from an enemy airship. In her sublease, Miss Roberts undertook to insure the premises against damage by fire, and if such damage occurred to pay for repairs. But she denied that she was responsible for damage by enemy attack. She had insured against ordinary fire risks with the Sun Insurance, but the policy expressly barred loss caused by an enemy. The society therefore declined to pay. Meanwhile, the freeholder had insured against aircraft risks with Lloyd's, but Lloyd's argued that their policy was only one of indemnity, and if the sub-lessees could get reinstatement under their lease they would have nothing to pay. The purpose of the action was to secure a declaration that the sub-lessees were under no liability to repair, and to recover damages from Miss Roberts for breach of covenant in not remedying the loss caused by the fire.

Mr. Justice Sargent, who tried the case, made some trenchant comments on the action of Lloyd's during the hearing. He remarked that, while taking the premium on the whole value, they practically said that they were insuring the ground landlord's interest only. If that was the result, he said, the sooner there was some legislation on the subject the better.

His lordship, giving judgment, declared that the liability fell as between the parties to the action upon Miss Roberts, and not upon the plaintiffs. He added that the sub-lessees had insured the contents of the factory and had recovered payment in that respect.

Lloyd's paid out under their policy to the freeholders, but made what his lordship thought the public would believe was an unexpected claim that, having made that payment, they could in the name of the freeholders recover the amount paid from the lessee, Miss Roberts. The underwriters were bringing an action against Miss Roberts accordingly.

Since it was discovered that the lessee and sublessee might be liable to the freeholders, they had made application to the Government for compensation. The reply was a non-possumus, as the committee dealing with such claims had been dissolved. His lordship regretted that, because persons in these circumstances were entirely within the spirit of the principle of compensation which the Government adopted at a time when damage of this kind had not been appreciated.

It was not necessarily sufficient that one person interested in a building should insure it against aircraft, unless it was quite clear that that person was the one upon whom the ultimate liability rested.

In his comments on the stand taken by Lloyd's, the judge might have gone a great deal farther than he did. It is nothing short of a public scandal that members of a corporation like this should be in a position to take people's money and then shelter behind a legal quibble when the question of discharging its liability arises. Mr. Justice Sargent was perfectly right when he said that the need for legislation is clearly indicated.

We have never departed from the view we expressed nearly two years ago, when the question of compensation for damage in air raids first began to be discussed, that such compensation should primarily be a national liability, or failing that a national asset. We still hold the same view, but apparently the Government has not seen its way clear to adopt the national liability suggestion in spite of latter day agitation to that end. But it is clear that something must be done to remove the anomalies disclosed by the case under discussion. As we said a year ago, an excellent and a very simple way out would be to pass a short Act dividing up the liability between the landlord and tenant in proper ratio, with the onus upon the landlord to see that adequate insurance is effected by the tenant, with the right to himself insure in the event of failure to cover on the part of the tenant within some short period of the enactment, and to recover the tenant's moiety by distraint if necessary.

If this course were adopted, everyone would at least know where he stood, and there would be an end to the present distressing state of injustice, which in the meantime directs moneys into channels into which they certainly should not morally go, whatever may be the legal aspect.

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National Aircraft Insurance.

Since our editorial on the above subject was in type further light is thrown upon the attitude taken up by the Government under similar conditions by Mr. Leonard Hill, of Margate, in a communication to the Press. He writes :—

> "In reference to Mr. Justice Sargent's remarks in the case of Enlayde (Ltd.) *v.* Roberts, in, at any rate, one case which has come under my notice the Government took the same point as was stated to have been taken by Lloyd's in this case, namely, that its contract was a contract for indemnity only. The Government, however, went further than Lloyd's, and for some time took up the position that it would pay nothing to the freeholder, who had insured on the full value, until the freeholder had exhausted her rights under the covenant by a lessee to repair. The Government held out for a considerable time, although I believe it paid eventually. While I am writing I may mention two other points in which the Government treatment of the insured has been markedly unfair, namely (A) where the insured transferred his interest in the property a month after taking out a Government policy, and the Government objected to allow an assignment of the policy on the ground that it was personal to the insured, and (B) where the policy was—as ninety-nine out of every hundred of these policies are—on the property covered by an existing fire insurance policy, and the Government refused to pay for damage done to garden walls on the ground that these walls were not included in the insurance against fire."

The British Air Services

"PER ARDUA AD ASTRA"

UNDER *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, November 7th.

Temp. Sub-Lieuts. (R.N.V.R.).—H. Eves and E. E. W. Butt, promoted to rank of Temp. Lieut. (R.N.V.R.), both with seniority Nov. 4th.; also A. E. Sole, with seniority Nov. 6th.

F. H. Stringer and B. E. Harrison, granted temp. commissions as Sub-Lieuts. (R.N.V.R.), and appointed to "President," additional, for R.N.A.S., date Nov. 4th.

H. B. Maund, entered as Prob. Flight Officer for temp. service, and appointed to "President," additional, for R.N.A.S., date Nov. 6th.

A. C. Burt and G. R. Marshall entered as Prob. Flight Sub-Lieuts. for temp. service, and appointed to "President," additional, for R.N.A.S., date Sept. 26th and Oct. 2nd respectively.

Louis J. Nobbs entered as Temp. Warrant Officer, sec. grade, and appointed to "President," additional, for R.N.A.S. date Nov. 6th.

Admiralty, November 8th.

Temp. Sub-Lieuts. R.N.V.R., G. Hazelton and A. P. Reed promoted to Temp. Lieuts., R.N.V.R., with seniority Nov. 5th.

The undermentioned have been entered as Prob. Flight Officers for temp. service, and appointed to the "President," additional, for R.N.A.S., all to date Nov. 12th: A. C. Gilner, J. L. Langton, D. E. Penney, J. M. McCleerey, and T. W. G. Thomson.

Admiralty, November 9th.

C. H. Swann and S. J. Green granted temp. commissions as Sub-Lieuts., R.N.V.R., seniority Nov. 8th.

Admiralty, November 11th.

The following have been granted temp. commissions as Sub-Lieuts., R.N.V.R., seniority as mentioned: I. H. McClure, E. A. Panterose, and W. E. Reetes, Nov. 11th; J. W. Morley, Nov. 26th.

The following have been entered as Prob. Flight Officers for temp. service, with seniority as stated: S. H. H. Ash, Oct. 11th; H. R. Dyke and L. H. G. Gillespie, Nov. 19th.

Admiralty, November 13th.

The following have been entered at Prob. Flight Officers, for temp. service, to date as stated: D. H. F. McMaster, Sept. 3rd; P. C. L. Young, C. M. Attlee, R. G. Jenkin, T. F. Gillespie, S. Quayle, H. L. Nelson, W. B. W. Clarke and E. E. Butler, Nov. 19th.

Royal Flying Corps (Military Wing).

London Gazette Supplement, November 4th.

Equipment Officers, 3rd Class.—(Substituted for the notifications in the *Gazette* of Nov. 1st): 2nd Lieut. A. C. Blackmore, Spec. Res., July 12th. Lieut. O. I. Preston, Notts. and Derby R. (T.F.), from a Flying Officer (Ob.); July 17th. Temp. 2nd Lieut. J. M. Macaulay, Gen. List; Aug. 1st.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: H. B. Begg, M. R. Helliwell, J. Paradise. The undermentioned to be 2nd Lieuts. (on prob.); Oct. 6th. Alexander Lorenza Waldeman Reginald Henry-Waetjen, Jared Douglas Eric Troop. The appointment of 2nd Lieut. (on prob.) Henry Robert Williamson, notified in the *Gazette* of Oct. 17th, is cancelled.

London Gazette Supplement, November 6th.

Special Appointments (graded as Park Commanders).—From Equipment Officers:—Oct. 13th: Capt. (Temp. Major) J. T. C. Moore-Brabazon, S.R., and to retain his temp. rank whilst so employed; Capt. (Temp. Major) T. V. Smith, M.C., S.R., and to retain his temp. rank whilst so employed; Lieut. (Temp. Capt.) S. A. Currin, S.R., and to be Temp. Major whilst so employed.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. H. Spanner, S.R.; Oct. 20th. 2nd Lieut. J. C. McMillan, R. Sc. Fus.; Oct. 22nd.

Flying Officers.—2nd Lieut. A. O. B. Traill, W. Rid. R., and to be secd.; Oct. 11th. 2nd Lieut. D. A. R. Chapman, Gen. List; Oct. 12th. Oct. 15th: 2nd Lieut. M. W. Turner Essex and Suff. R.G.A. (T.F.); 2nd Lieut. (Temp. Lieut.) G. T. Willcox, High. L.I. (T.F.); Temp. 2nd Lieut. H. W. H, Marshall, W. York. R., and to be transfd. to Gen. List. 2nd Lieut. A. C. S. Irwin, R. Ir. Rif., and to be secd.; Oct. 16th. 2nd Lieut. (on prob.) G. S. Deane, S.R.; Oct. 18th. Oct. 19th: Temp. 2nd Lieut. H. G. C. Bowden, Gen. List; 2nd Lieut. S. Willmett, S.R.; Temp. Lieut. E. F. Wessel, R. Fus., and to be transfd. to Gen. List; 2nd Lieut. P. L. Plant, R. Ir. Fus., S.R., and to be secd.; 2nd Lieut. R. B. Bourne, S.R.; Temp. 2nd Lieut. C. A. Bourne, Gen. List, from a Flying Officer (Ob.), with seniority from Oct. 25th, 1915; Temp. 2nd Lieut. C. V. de B. Rogers, Gen. List; 2nd Lieut. R. W. Reid, S.R. Oct. 20th: 2nd Lieut. (Temp. Lieut.) P. W. Murray, Duhr. L.I. (T.F.); Temp. Lieut. J. Parry, A.S.C., and to be transfd. to Gen. List; 2nd Lieut. (Temp. Lieut.) A. J. C. E. Phillippo, A.S.C., and to be secd.; 2nd Lieut. A. V. H. Gompertz, S.R.; Temp. Lieut. F. H. Turner, M.C., Glouc. R., and to be transfd. to Gen. List. Oct. 21st: 2nd Lieut. C. E. de Berigny, Spec. R.; Lieut. J. M. J. C. J. I. Rock, Bedf. R. (T.F.); 2nd Lieut. A. P. Hartley, Ches. R. (T.F.); 2nd Lieut. S. S. B. Purves, Sco. Horse Yeo. (T.F.); 2nd Lieut. V. H. Adams, S.R. The surname of 2nd Lieut. (on prob.) A. R. M. Scrase-Dickins is as now described, and not as in the *Gazette* of Oct. 23rd.

Flying Officer (Observer).—Temp. 2nd Lieut. G. N. Dennis, E. York. R.; Oct. 22nd.

Balloon Officer.—2nd Lieut. J. Baxter, Gen. List; Oct. 12th.

Equipment Officers, 2nd Class.—From Asst. Equipment Officers, and to be Temp. Lieuts. whilst so employed: 2nd Lieut. J. D. Troup, S.R.; Sept. 26th. 2nd Lieut. J. C. Forsyth, S.R.; Oct. 17th.

Special Appointment (graded as an Equipment Officer, 2nd Class).—Temp. 2nd Lieut. T. F. G. Strubell, Gen. List, from an Equipment Officer, 3rd Cl., and to be Temp. Lieut. whilst so employed; Sept. 26th.

Equipment Officers, 3rd Class.—2nd Lieuts., Gen. List: H. C. Williamson; June 22nd. W. Millett; June 23rd. July 1st: L. Auker, W. H. Clover. F. Pratt; Oct. 1st. Oct. 12th: J. Rigby, C. L. Archbold, O. W. Latimer, J. Rylands. J. P. Angell; Oct. 19th. The appointments of the under-mentioned, notified in the *Gazette* of Sept. 27th. are antedated to Aug. 1st:—2nd Lieuts., S.R.: H. H. W Vowden, H. E. L. Pilbrow, G. A. Lawlor, E. G. Herbert, L. Stones.

Memoranda.—The under-mentioned Cadets to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.:—Nov. 5th: D. C. Sutherland, F. Briggs, H. McG. Wood, D. H. Etheridge, A. Howard, E. C. Frisby. The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.:—Nov. 5th: Sergt. R. Rainford, L.-Corpl. A. Hodgkins, Pte. R. Leake, Sergt. P. R. Garner, Sergt.-Drmr. G. J. Enguell, L.-Corpl. E. E. Beaumont.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: S. Willmett, A. V. H. Gompertz, C. E. de Berigny, R. B. Bourne, R. W. Reid, V. H. Adams. The under-mentioned to be 2nd Lieuts. (on prob.):—Oct. 16th: H. F. Wilkinson, J. D. Smith. A. R. Mitchell; Nov. 5th. Nov. 6th: E. P. Proud, W. S. Farley, C. J. S. Holden.

London Gazette, November 7th.

Special Appointments (graded as Park Commanders).—Lieut. (Temp. Capt.) B. S. Foster, Hamps. R. (T.F.), and to be Temp. Maj. whilst so employed; Sept. 2nd. Lieut. (Temp. Capt.) H. S. Ebben, S.R., from an Equipment Officer, and to be Temp. Maj. whilst so employed; 26th Sept. Temp. Capt. F. W. K. Davies, A.S.C., to be transferred to Gen. List, and to be Temp. Maj. whilst so employed; Sept. 20th (substituted for the notification in the *Gazette* of Oct. 5th).

Flight Commanders.—From Flying Officers. And to be Temp. Capts. whilst so employed. 19th Sept.: 2nd Lieut.

(Temp. Lieut.) N. J. Bengough, Fife and Forfar Yeo. (T.F.); 2nd Lieut. (Temp. Lieut.) H. Hemming, Worc. R. 2nd Lieut. W. G. Pender, S.R.; Oct. 16th. Oct. 18th: Temp. 2nd Lieut. J. McArthur, Gen. List; 2nd Lieut. G. S. Thorne, S.R.; 2nd Lieut. L. W. Hall, Bord. R.; Oct. 20th.

Flying Officers.—Temp. Capt. J. W. Tailford, Gen. List; Aug. 4th. (Substituted for the notification in the *Gazette* of Aug. 25.) 2nd Lieut. R. L. Edward, Liverpool R., and to be seconded; Oct. 17th. Oct. 19th: Temp. 2nd Lieut. W. N. Hamilton, Northd. Fus., and to be transferred to Gen. List; 2nd Lieut. F. W. Ward, N. Staff. R., and to be seconded. Temp. 2nd Lieut. J. R. Middleton, Camn. Highrs., and to be transferred to Gen. List; 20th Oct.

Flying Officers (Observers).—Capt. H. H. Bagnall, Middx. R. (T.F.); April 22nd. Aug. 15th: Lieut. R. P. I. Cochrane, 17th Cav., Ind. Army; Temp. Lieut. W. A. Forsyth, R.A., and to be transferred to Gen. List; 2nd Lieut. E. N. D. Barr, R.F.A., S.R.; 2nd Lieut. L. H. Browning, R.A., and to be seconded.

Equipment Officers, 3rd Class.—Temp. Capt. T. E. Gilmore, Northn. Fus., and to be transferred to Gen. List: Aug. 17th. Temp. 2nd Lieut. A. D. Bateman, R. W. Kent R., and to be transferred to Gen. List; Aug. 22nd. Sept. 19th: 2nd Lieut. G. A. Turner, Dorset R., S.R., and to be seconded; Temp. 2nd Lieut. (on prob.) J. Jardine, R.E.; 2nd Lieut. (on prob.) R. Clelland, S.R.; Oct. 21st.

Assistant Experimental Officer (graded as an Equipment Officer, 3rd Class).—2nd Lieut. (Temp. Lieut.) J. R. H. Whiston, Notts. and Derby. R. (T.F.); Oct. 18th.

Memorandum.—Sergt.-Maj. A. M. Saywood, from R.F.C., to be 2nd Lieut. for duty with R.F.C.; Nov. 1st.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) G. S. Deane is confirmed in his rank. C. R. Becke to be 2nd Lieut.; Sept. 3rd. The undermentioned to be 2nd Lieuts. (on prob.): H. L. U. Clark; Oct. 16th. J. R. McDonnell; Oct. 22nd. S. G. Elliott-Smith; Oct. 24th. Nov. 5th: T. H. Cooper, F. G. Buck, S. A. Mitchell, S. G. Linssen, C. Groves, S. Wilson, H. W. Prockter, L. H. Clifford, W. G. Murray, R. Rochford, F. D. Lugard, L. S. Pape, S. J. Vine.

London Gazette Supplement, November 8th.

The undermentioned to be Temp. 2nd Lieuts. (on prob.):

For Duty with R.F.C.—Sergt. S. Jolley, from R.F.C.; Oct. 10th. Sergt. J. R. Bingham, from H.A.C. (T.F.); Oct. 12th. Oct. 13th: Acting Sergt.-Maj. F. Knight, from R.F.C.; Acting Sergt. J. W. Askham, from R.F.C.; 2nd Class Air Mech. R. G. Shackel, from R.F.C. Oct. 14th: Corpl. G. G. Williams, from 28th Lond. R. (T.F.); 1st Class Air Mech. P. S. Riach, from R.F.C.; Pte. K. R. Napier, from Can. Corps. Cav. Regt. Oct. 15th: 1st Class Air Mech. C. A. Stevenson, from R.F.C.; Pte. B. W. A. Ordish, from Lond. R. (T.F.); Acting Sergt. H. S. Elliott, from Can. A.S.C.: Oct. 16th.

Wing Commanders.—From Squadron Comdrs. And to be Temp. Lieut.-Cols. whilst so employed. Sept. 21st: Capt. (Temp. Maj.) R. P. Mills, M.C., R. Fus.; Capt. (Temp. Maj.) T. W. C. Carthew, D.S.O., Bedf. R., S.R.

Flight Commanders.—From Flying Officers. Oct. 9th. Temp. Capt. F. D. Berridge, Gen. List; 2nd Lieut. A. S. C. MacLaren, M.C., K.O. Sco. Bord., S.R., and to be Temp. Capt. whilst so employed.

Flying Officers.—Oct. 4th: 2nd Lieut. (Temp. Lieut.) D. V. D. Marshall, High. Divl. Trains, A.S.C. (T.F.); Temp. Lieut. J. K. Robertson, A.S.C., and to be transferred to Gen. List; 2nd Lieut. (on prob.) A. E. Venables, S.R. Temp. 2nd Lieut. F. S. Potts, Gen. List; Oct. 19th. Oct. 20th: Temp. 2nd Lieut. (on prob.) A. R. Nock, R. War. R., and to be transferred to Gen. List; 2nd Lieut. (Temp. Lieut.) W. F. T. James, Glamorgan Yeo. (T.F.); Temp. 2nd Lieut. (Temp. Lieut.) W. G. Chambers, Linc. R.; Temp. 2nd Lieut. W. Mitton, Linc. R.; Temp. 2nd Lieut. E. A. Welch, Lanc. R., and to be transferred to Gen. List; Capt. W. W. Leete, Ches. R. (T.F.); Temp. Lieut. N. A. Birks, Machine Gun Corps (Motor), and to be transferred to Gen. List; Temp. 2nd Lieut. J. F. Duff, Gen. List. Oct. 21st: 2nd Lieut. (on prob.) N. L. Knight, S.R.; 2nd Lieut. (on prob.) R. W. Jones, S.R. Oct. 22nd: 2nd Lieut. (Temp. Capt.) W. S. Farren, Aircraft Parks, R.F.C. (T.F.); 2nd Lieut. R. M. Findlay, Co. of Lond. Yeo. (T.F.); Temp. 2nd Lieut. (on prob.) E. T. Collins, Gen. List; 2nd Lieut. (on prob.) D. N. Robertson, S.R. Oct. 23rd: Temp. 2nd Lieut. E. Hamilton, Machine Gun Corps, and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) R. N. Smith, Hamps. R., and to be transferred to Gen. List; 2nd Lieut. (on prob.) F. C. Young, S.R.; 2nd Lieut. (on prob.) A. L. Macfarlane, S.R. Oct. 24th.

Equipment Officer, 3rd Class.—2nd Lieut. C. R. Becke, S.R.; Oct. 2nd.

Memorandum.—Pte. G. Edwards from A.S.C. to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Oct. 27th.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) D. N. Keith is confirmed in his rank. The undermentioned to be 2nd Lieuts. (on prob.): G. Urquhart; Oct. 21st. Nov. 5th: J. H. Secker, A. G. Stradling, O. L. Vetter, J. D. Richards.

London Gazette Supplement, November 9th.

Flying Officers (Observers).—Oct. 24th: Temp. Lieut. D. M. Murdoch, Essex R., and to be transferred to Gen. List; Temp 2nd Lieut. L. B. Williams, Army Cyclist Corps, and to be transferred to Gen. List; 2nd Lieut. G. F. Bishop, Lond. R. (T.F.); Temp. 2nd Lieut. L. Waight, Gen. List. Temp. 2nd Lieut. E. T. Pruen, Gen. List; Oct. 25th.

Memorandum.—Pte. F. M. Thomas from Bedf. R. (T.F.) to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C., Nov. 5th.

THE UNION OF LONDON & SMITHS BANK L
FLIGHT

A detachment of the R.N.A.S. in the Lord Mayor's Procession on November 9th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: F. C. Young, G. R. Nicholson, R. Donald, A. L. Macfarlane, A. S. F. Morris, A. E. Venables, D. N. Robertson, R. W. Jones. H. G. Gold to be 2nd Lieut; 3rd Sept. E. Butler to be 2nd Lieut. (on prob.); Aug. 24th.

London Gazette, November 10th.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed. Oct. 30th: 2nd Lieut. G. P. S. Reid, M.C., Sea. Highrs.; 2nd Lieut. E. Henty, S.R.

Balloon Officers.—Oct. 14th: Temp. Capt. H. V. Knox, Oxf. and Bucks. L.I., and to be transferred to Gen. List; Lieut. H. N. Witting, R.W. Surr. R., S.R., and to be seconded; Temp. 2nd Lieuts., Gen. List—E. H. Channon, H. W. Ingram, R. G. C. Pinfield, W. E. Wright.

Equipment Officers, 3rd Class.—2nd Lieut. (on prob.) A. E. Verpilleux, S.R.; July 31st. 2nd Lieut. I. M. Rodney, Dorset R., from a Flying Officer; Aug. 17th. 2nd Lieut. (on prob.) W. Birtwistle, S.R.; Sept. 4th. 2nd Lieut. F. L. Fletcher, Manch. R. (T.F.); Sept. 13th. Oct. 1st: Temp. 2nd Lieut. A. L. Pearce, Gen. List; 2nd Lieut. H. G. Gold, S.R. Temp. 2nd Lieut. V. C. Legg, Gen. List; Oct. 2nd. Oct. 4th: Temp. 2nd Lieut. (on prob.) H. A. Blanchard, Gen. List; Temp. 2nd Lieut. (on prob.) L. A. Goss, Gen. List. 2nd Lieut. (on prob.) R. N. Vyvyan, S.R.; Oct. 9th; 2nd Lieut. R. H. Rayner, W. Rid. R. (T.F.). Oct. 12th. Temp. 2nd Lieut. C. R. Coffey, Gen. List; Oct. 16th. 2nd Lieut. (on prob.) H. E. Earl, Rif. Brig., S.R., and to be seconded; Oct. 19th.

Memoranda.—2nd Class Air Mech. L. P. Timmins, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Nov. 5th. C. Channing to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Nov. 6th.

London Gazette Supplement, November 11th.

Flying Officers.—Oct. 22nd: 2nd Lieut. W. B. Clark, Sussex Yeo. (T.F.); 2nd Lieut. P. L. Wood, S.R. Oct. 23rd: Maj. O. M. Conran, R. Lanc. R.; Lieut. C. H. Windrum, R. W. Kent R., and to be seconded. Oct. 24th: 2nd Lieut. (Temp. Lieut.) R. W. P. Hall, W. Lan. Brig., R.F.A. (T.F.); 2nd Lieut. W. W. Cowan, R. Scots (T.F.); 2nd Lieut. G. E. Gordon Duff, Camn. Highrs., and to be seconded. Temp. Lieut. E. H. Tatton, E. York. R., and to be transferred to Gen. List; Oct. 25th.

Balloon Officers.—Oct. 26th: 2nd Lieut. (Temp. Lieut.) B. D. Higman, Lond. R. (T.F.); 2nd Lieut. A. R. Wilkie, Middx. R. (T.F.); Temp. 2nd Lieut. H. Cresswell, Gen. List; Temp. 2nd Lieut. S. C. Lumb, Gen. List; Temp. 2nd Lieut. C. E. Mott, Gen. List.

Memorandum.—Cadet A. Gane to be Temp 2nd Lieut. (on prob.) for duty with R.F.C.; Nov. 5th.

Supplementary to Regular Corps.—2nd Lieut. H. D'O. Beningfield is dismissed the Service by sentence of a General Court-martial; Sept. 7th. The appointment of 2nd Lieut. (on prob.) A. C. Blackmore, notified in the *Gazette* of July 27th, is antedated to June 19th. The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: W. Birtwistle, P. L. Wood, A. E. Verpilleux, R. N. Vyvyan. H. L. Webb to be 2nd Lieut.; Oct. 19th. L. A. Owen to be 2nd Lieut. (on prob.); Nov. 5th.

London Gazette Supplement, November 13th.

Flying Officers.—2nd Lieut. A. N. G. Summers, 9th Lrs., and to be secd.; Oct. 1st. 2nd Lieut. E. N. Griffith, Oxf. and Bucks. L.I., S.R., and to be secd.; Oct. 21st. 2nd Lieut. F. W. Partington, S. Lan. R., S.R., and to be secd.; Oct. 23rd. Oct. 24th: 2nd Lieut. C. T. Wilson, R. Ir. Fus., S.R., and to be secd.; Temp. 2nd Lieut. (on prob.) E. W. A. Hunt, Gen. List; 2nd Lieut. E. A. Mearns, S.R.; Temp. 2nd Lieut. T. H. Gladstone, Gen. List; Temp. 2nd Lieut. F. E. Wilshere, Rif. Brig., and to be transfd. to Gen. List; Temp. 2nd Lieut. J. H. Medcalf, Bord. R., and to be transfd. to Gen. List; 2nd Lieut. D. McC. Kerr, S.R.; Temp, Capt. J. E. Chick, A.S.C., and to be transfd. to Gen. List; Oct. 25th.

Equipment Officers, 3rd Class.—2nd Lieut. P. H. R. Whittet, S.R.; Sept. 29th. Temp. 2nd Lieut. C. H. Simpson, Gen. List; Oct. 2nd. 2nd Lieut. H. L. Webb, S.R.; Oct. 27th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: R. Clelland, E. E. Cutts, D. McC. Kerr, C. Deards, E. A. Mearns, P. H. R. Whittet.

School of Aerial Gunnery.

London Gazette Supplement, November 13th.

Assistant Instructors (graded as Equipment Officers, 2nd Class, and to be Temporary Lieutenants while so employed).—Oct. 24th: Temp. 2nd Lieut. H. Cockerell, Gen. List, from a Flying Officer (Ob.); 2nd Lieut. P. H. R. Whittet, S.R., from an Equipment Officer, 3rd Cl.

Wireless and Observers' School.

London Gazette Supplement, November 11th.

Commandant (graded as a Park Commander).—Lieut. (Temp. Capt.) H. A. Oxenham, S.R., from an Equipment Officer, and to be Temp. Maj. whilst so employed; Oct. 8th.

Royal Flying Corps (Territorial Force).

London Gazette, November 7th.

Hampshire Aircraft Park.—2nd Lieut. (Temp. Capt.) W. S. Farren is seconded for duty with the R.F.C.; Oct. 22nd.

Aeronautical Inspection Department.

London Gazette Supplement, November 1st.

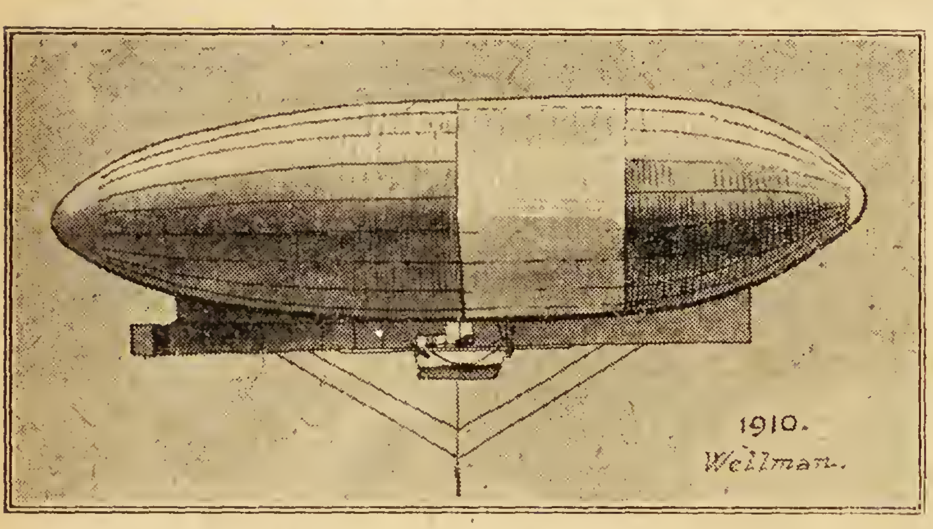
E. Leonard Mann to be Temp. Hon. Lieut. (without pay and allowances) whilst employed as an Asst. Inspr. Aeronautical Dept.; Nov. 1st.

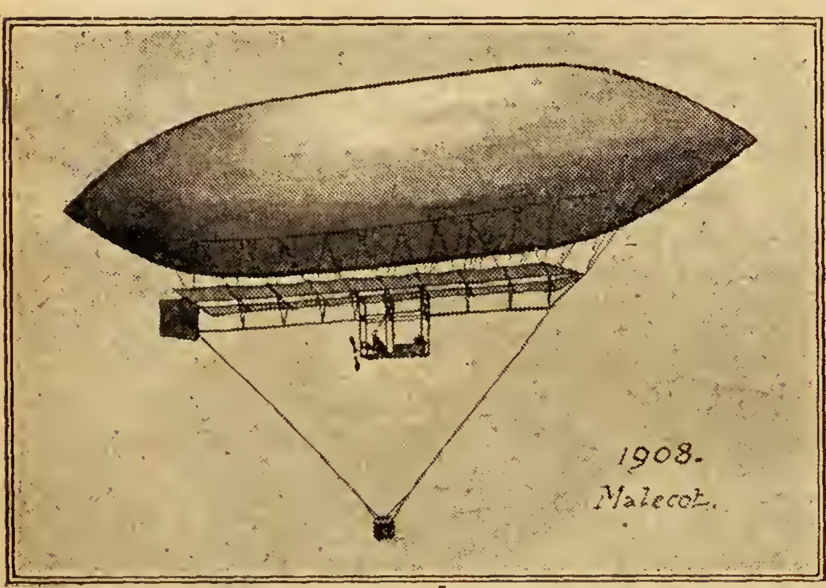
And a detachment of the R.F.C.

AIRSHIP PIONEERS

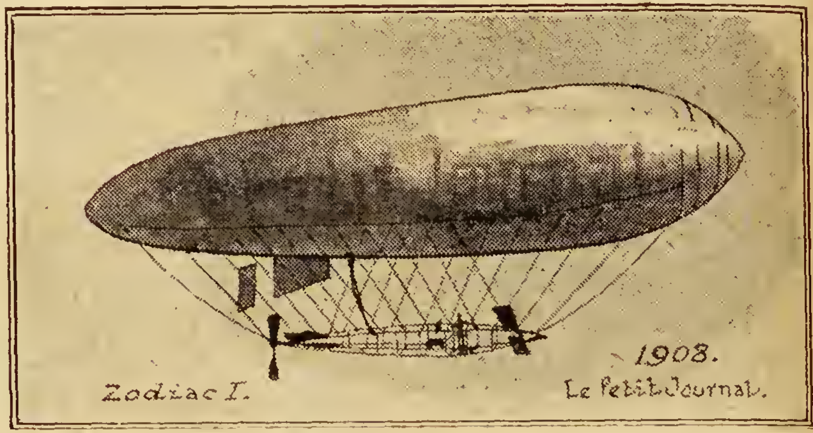
(Concluded from p. 980.)

To go back to the efforts made from 1907. Encouraged by the results obtained from his first airship, Comte de la Vaulx, with M. Mallet, formed the Société Française de Ballons Dirigeables et d'Aviation "Zodiac," at Puteaux. The first dirigible produced by this firm was the "Zodiac I," "Le Petit Journal," in 1908. This was a small sporting airship of neat appearance. Its main feature as with succeeding models, was the ease with which it could be dismantled and transported from place to place. It had a cigar-shaped envelope, below which was suspended a rectangular *nacelle*, tapering both ends, built up in three sections. The central section carried the power plant, pilot and passenger. The engine, a 16 h.p. Clerget, drove through a jointed shaft an 8 ft. propeller at the rear of the *nacelle*, and also operated the air-ballonet pump. Either coal-gas or hydrogen could be used. Steering was effected by horizontal planes mounted on the bow of the *nacelle*, and a rudder attached to the envelope at the rear. The succeeding Zodiacs were very similar in design, and differed only in dimensions and details.

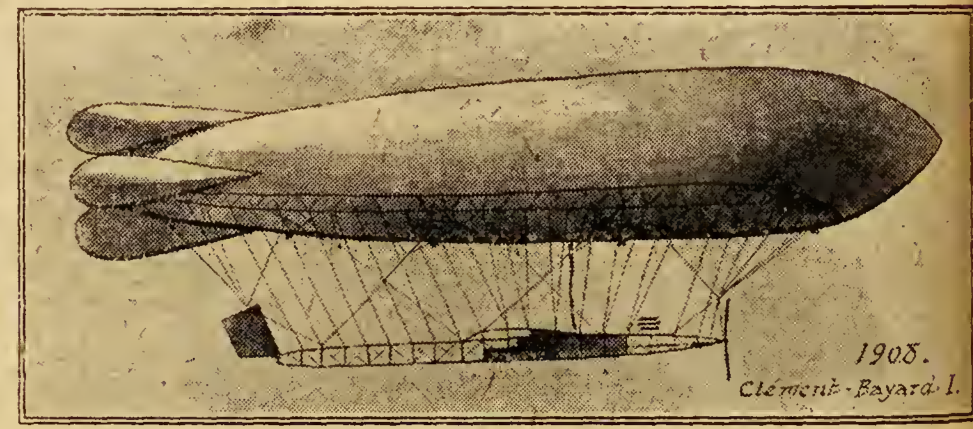

1910. Wellman.

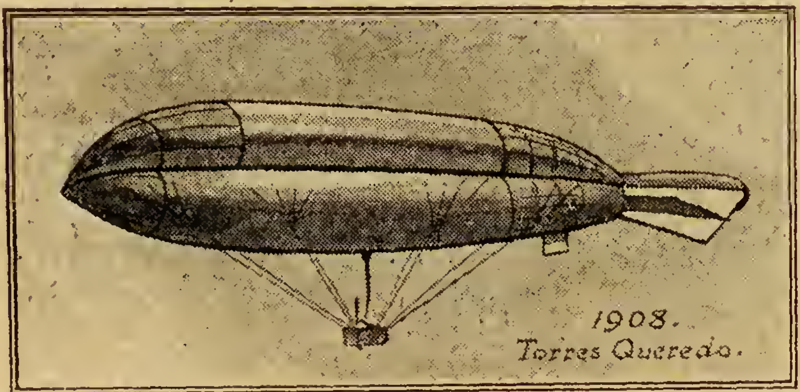

1908. Malecot.

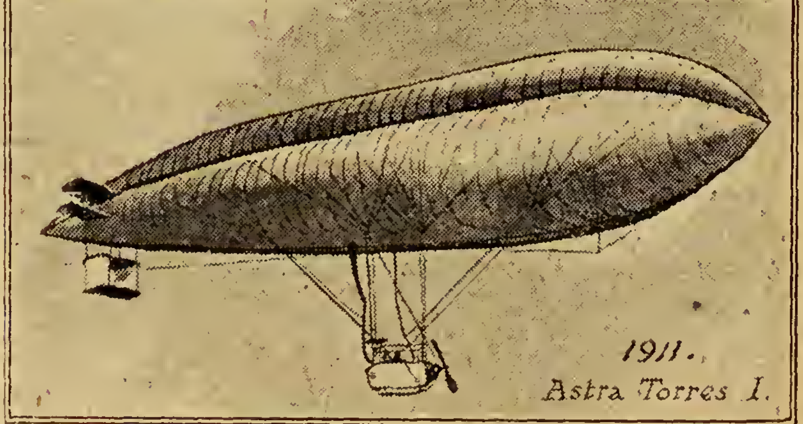
M. Malecot, another Frenchman, carried out some trials in 1908 with a rather novel type of semi-rigid airship. Its main feature consisted in the employment of a large plane surface mounted below the envelope. This surface measured about 1,500 square ft., and was mounted on the top of a triangular wooden frame, forming the keel, to which the car was rigidly attached. A 28 h.p. engine was mounted in the car, and drove a propeller at the rear of the latter. Steering in the horizontal plane was accomplished in the usual manner by a rudder fixed to the rear of the keel, but vertical steering was brought about by changing the position longitudinally of a small ballast basket suspended some 60 ft. below the keel. Although several successful flights were put up by this ship, it did not appear to offer any great advantage over orthodox dirigibles of that day.


Zodiac I. 1908. Le Petit Journal.

The same year, the Astra Co., of Billancourt (founded by M. Surcouf, and the builders of the "Ville-de-Paris"), constructed a ship, somewhat on the lines of the "Ville-de-Paris," for M. Clement, the well-known motor engineer. "Clement-Bayard I" differed from the "Ville-de-Paris" mainly in the provision of pear-shaped inflated fins instead of cylindrical ones. A similar shaped *nacelle* was used, but the power plant—a 120 h.p. Clement-Bayard engine driving a tractor screw—and the pilot, passengers, &c., were all concentrated in one centrally disposed "cabin." Most of the succeeding Astra vessels followed the same general design of "Clement-Bayard I," but other Clement-Bayard ships


1908. Clément-Bayard I.

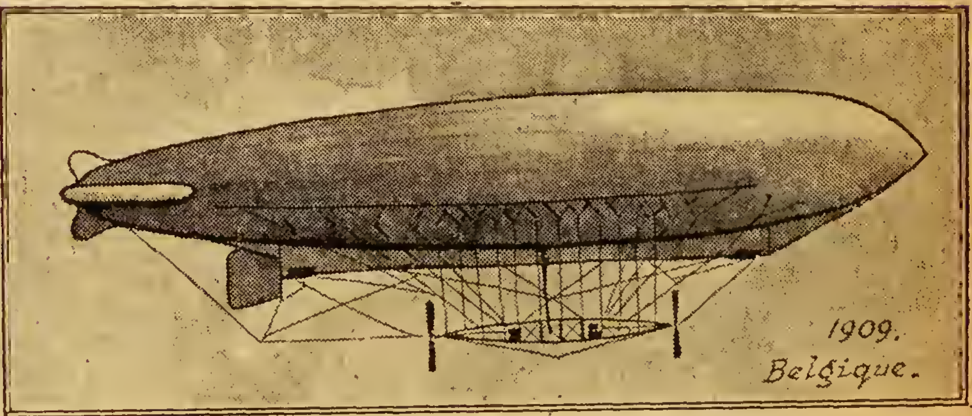

1908. Torres Quevedo.


1911. Astra Torres I.

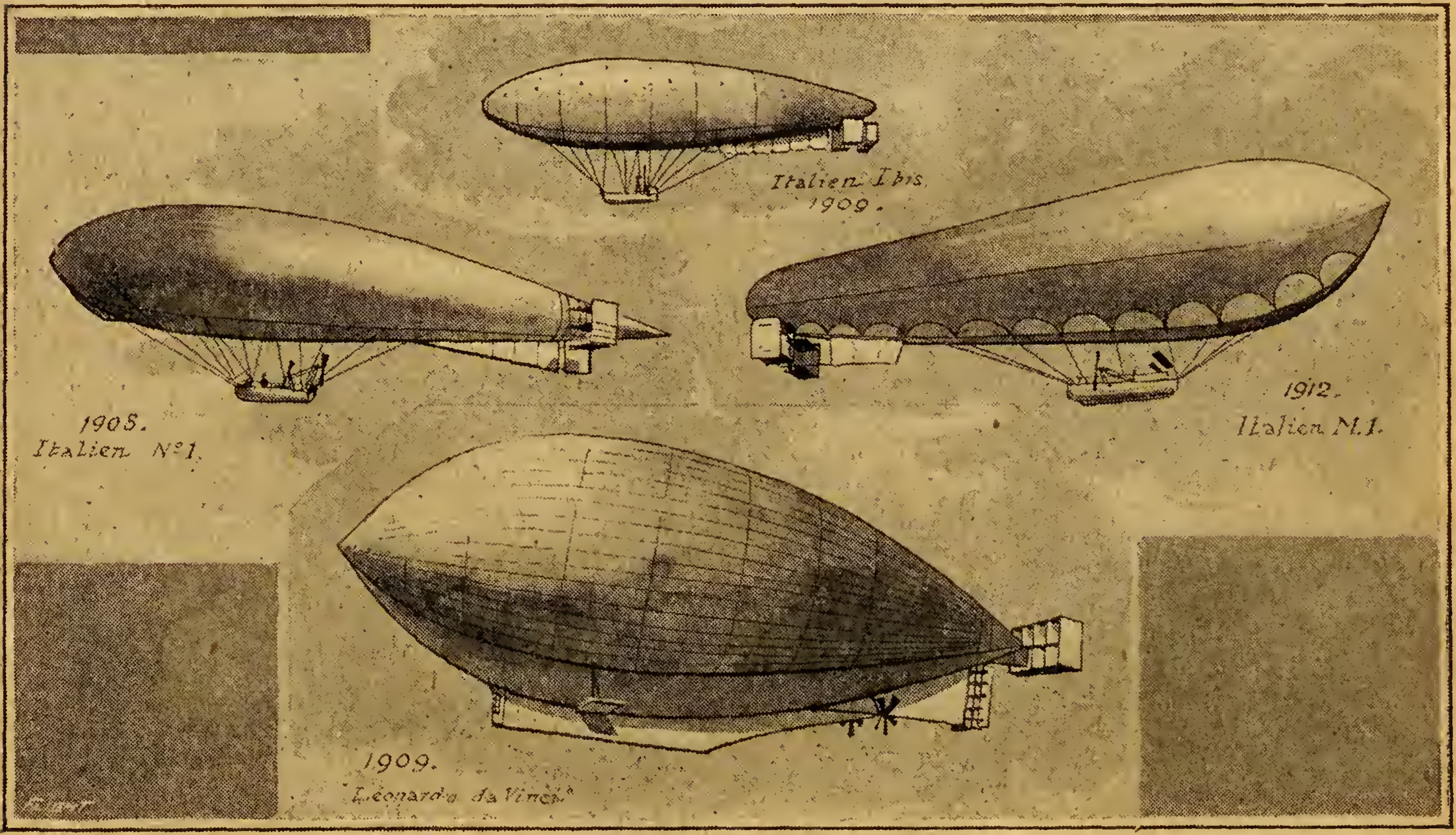
were constructed by a separate company of that name. These vessels had cigar-shaped envelopes without any inflated fins, these being replaced by plane surfaces mounted on the *nacelle*. The tractor screw was also dispensed with, and two side propellers used instead. Later models employed a short car instead of the long *nacelle*.

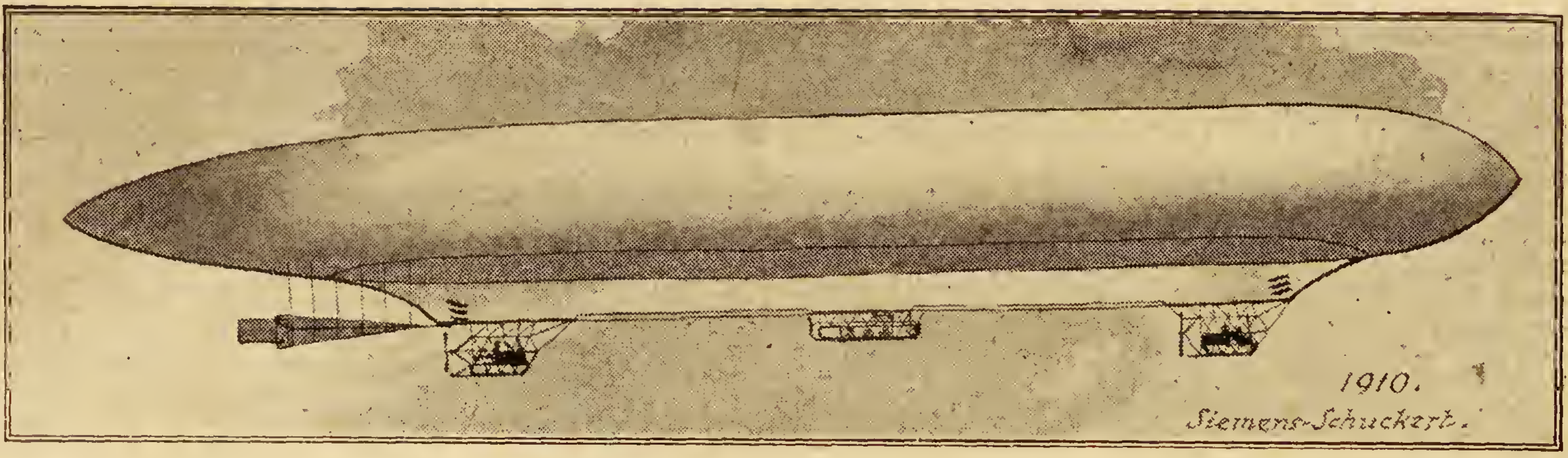
Another type of dirigible produced by the "parent" Astra Co., was the Astra-Torres, a development of the Spanish airship, "Torres Quevedo," built in 1908. The feature of this latter ship was in the trefoil shape in section of the envelope, and the method of suspension. The envelope was internally braced, across the points of intersection of the three shapes, and the suspension lines of the car were also attached to the points of intersection. The Torres-Quevedo airship was 118 ft. long, and the car contained two 40 h.p. Antoinette motors, each driving a side propeller. The Astra-Torres, No. 1, of 1911, employed this system of envelope and suspension, but was much larger and improved. A 55 h.p. Chenu drove a tractor screw mounted on the front of the car.

Italy also joined the ranks of airship pioneers in 1908, Captains Crocco and Ricaldoni producing a very successful semi-rigid dirigible of graceful appearance. The envelope, of streamline shape, tapered from a maximum diameter far forward, of about 33 ft., to a fine point at the stern. Later, when this ship was rebuilt as No. 1 *bis*, the rear portion of the envelope was given a much blunter point, which certainly improved the ship constructionally, if not artistically. Inside the lower portion of the envelope, which forms the air ballonet, was a metal backbone, extending through the envelope at the rear in the form of a fin, to which the rudder was hinged. Suspended from the backbone was a boat-shaped car, which contained a 100 h.p. Clement-Bayard engine driving a pair of side propellers, mounted above the car. Elevating planes were fitted to the tail of the envelope. The construction of No. 1 *bis* was similar, but modified to the extent that the envelope was divided up into seven entirely separate gas compartments, each with an air ballonet. The backbone was also divided into sections. These ships were used by the Army and classed as the "P." 1, 2, 3, &c., whilst later improved types of 1912, known as the "M" class, were taken over by the Navy. Another type of Italian semi-rigid airship was the Forlanini. This had a stumpy envelope built up on a somewhat elaborate framework of metal tubing, forming a backbone. The lower portion of the envelope, from stem to stern, was partitioned off to form an air ballonet, and it was within this chamber the envelope was attached to the frame. Communication with the atmosphere was made through the walls of the ballonet. The framework extended below the envelope, and formed a keel extending from the stern for about two-thirds the length of the ship. The front portion of the keel was built up into a cabin for the pilot and passengers, whilst the rear portion carried the steering planes and propeller supports. The whole keel was covered in, and special windows were fitted in front. The engine, a 40 h.p. Antoinette, was located in the keel behind the fore cabin and drove two propellers situated at the extreme stern of the ship, through gearing and shafts. A small auxiliary engine operated an air pump for maintaining the pressure in the air compartment and also for ventilating and renewing the air in the cabin, which, it must be remembered, was in direct communication with the lower portion of the envelope or air ballonet. The first ship was named "Leonardo da Vinci," and was, on the whole, most successful. Succeeding models were of the same general design, but were larger and had a high fineness ratio.

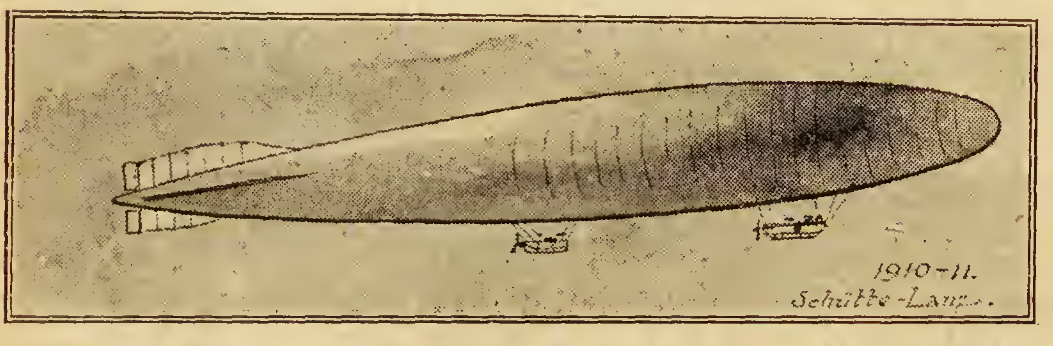


Belgium had a dirigible constructed for her in 1909 by M. Godard, of France. This was of the semi-rigid type, the envelope being attached to a rigid keel from which a girder-form *nacelle* was suspended. The latter contained two 55 h.p. Vivinus motors, one driving a tractor screw, and one a propeller, both mounted at the ends of the *nacelle*. A separate motor operated the air-ballonet pump, and provision was made for warming the air if required. Inflated fins were attached to the tail of the envelope, a horizontal one tubular in shape, and two vertical of pear shape. A





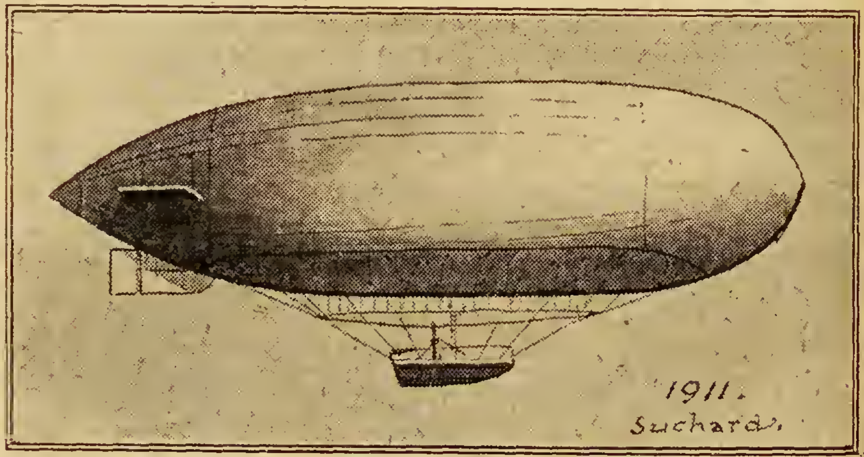
rudder was hinged to the rear of the keel, which was covered with fabric the whole of its length. A speed of 25 m.p.h. was obtainable with this dirigible.

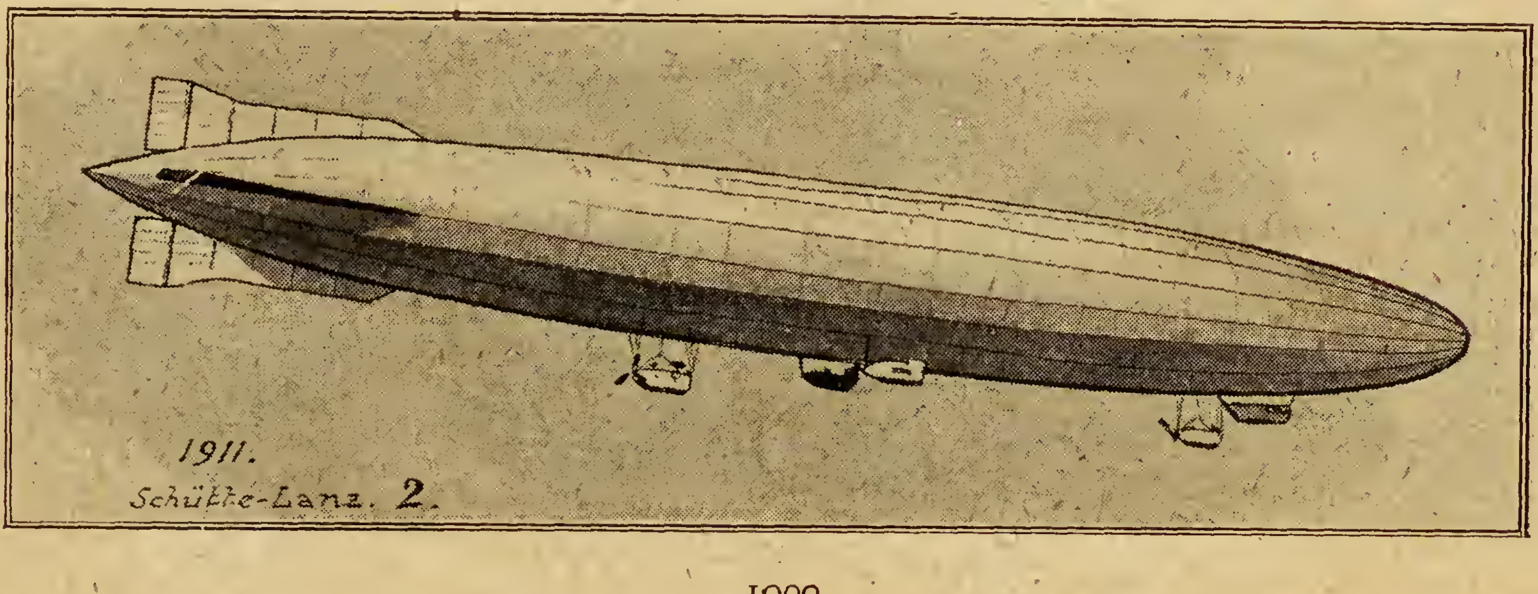

1910-11.
Schütte-Lanz.

The next airship to be considered is the large semi-rigid built by Siemens-Schuckert in Germany during 1910. In outward appearance this ship very much resembled a Zeppelin. The envelope, which was 387 ft. long and 43 ft. in diameter, was attached to a long covered-in keel. To this keel were attached, fairly close up, three gondolas, one at each end and one in the centre. The two end gondolas each contained two 125 h.p. Mercedes engines located fore and aft. The forward engine drove two side screws, and the rear engine was coupled direct to a propeller at the stern of the gondola. The central gondola was for passengers, although we believe experiments were made with an engine mounted in this car driving a lifting screw. The results obtained with this ship were apparently unsuccessful, for no more was heard of it after the trials.

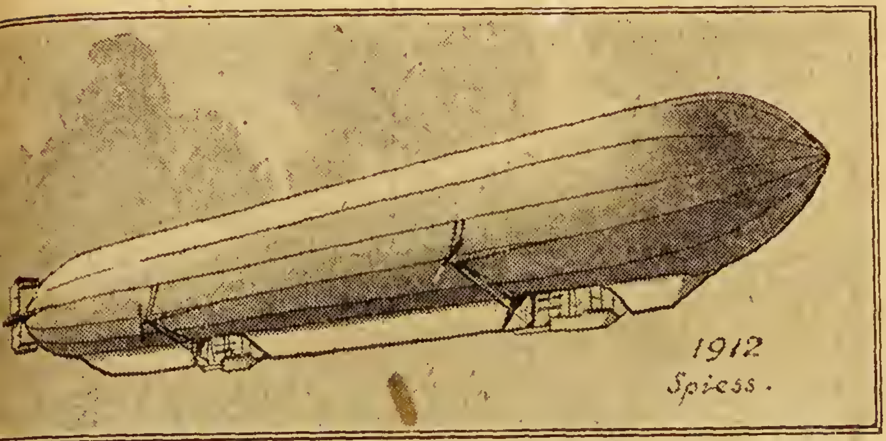
In the following year Germany produced another dirigible on rigid lines in the Schütte-Lanz. This differed from the Zeppelin in the employment of wood for the framework, and that its shape was of streamline, or cigar, form. The wood frame was built up of spirally-laid ribs or stringers on circular formers. The whole was elaborately braced with wire. There were two gondolas slung some distance below the body—one, the larger, being comparatively far forward and the other a little to the rear of the centre. Each contained a 270 h.p. Mercedes engine driving a single propeller. Rudders and elevators were attached to vertical and horizontal fins respectively, mounted on the stern of the body. The early trials did not meet with over much success, but, after several modifications, it was rendered serviceable enough to be taken over by the Government. The second ship, "S.L.2," however, was far more successful. It was considerably larger, and bore a striking resemblance to Zeppelin "L.33," recently described in FLIGHT. The arrangement of the gondolas was very similar, except that an additional large, enclosed cabin was attached to the body in front of the forward gondola. Each gondola contained a 180 h.p. Maybach engine driving a propeller at the rear.

Walter Wellman was not the only one to conceive the idea of crossing the Atlantic by dirigible, for a German American, Joseph Brucker, constructed an airship in Germany in 1911. The expedition was backed financially by the well-known Swiss firm of Suchard, and hence the ship was named the "Suchard." The designers centred their efforts mainly on the question of safety and large range of action, by producing a ship of comparatively large size and low speed. It had a streamline envelope made of a special fabric, consisting of three layers of rubber-impregnated cloth. Suspended from the envelope was a car in the form of a seaworthy boat and between the former and the latter was a light platform or deck. The boat, which was well equipped and provisioned, contained two 110 h.p. N.A.G. engines, driving port and starboard propellers. As in the Wellman airship, a special form of guide rope was employed to maintain vertical equilibrium. This consisted of a trailing cable

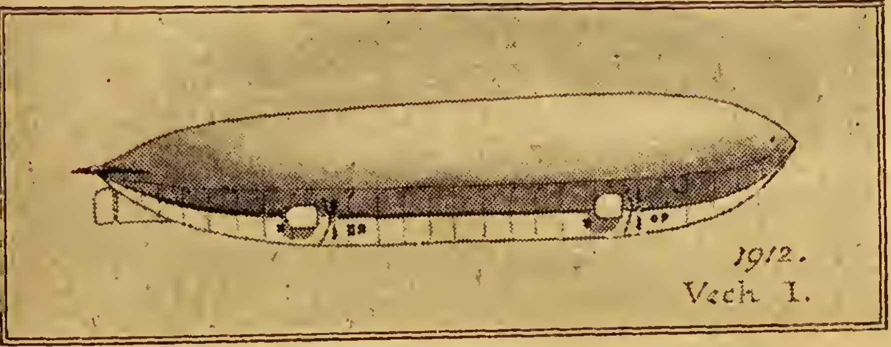




to which were attached a series of streamlined vessels, which scooped up the water as they were drawn through it. The problem of the continual variation in the temperature by night and day, and its effect on the gas in the envelope, was handled in a very ingenious manner. In addition to the air ballonet, which had a capacity of about one-third the total volume, the envelope could be cooled, by means of an external water spray. For this purpose a perforated hose was mounted along the top of the envelope, and water was pumped into it from the boat. This ship underwent numerous trials and modifications, but the Trans-Atlantic flight never materialised.

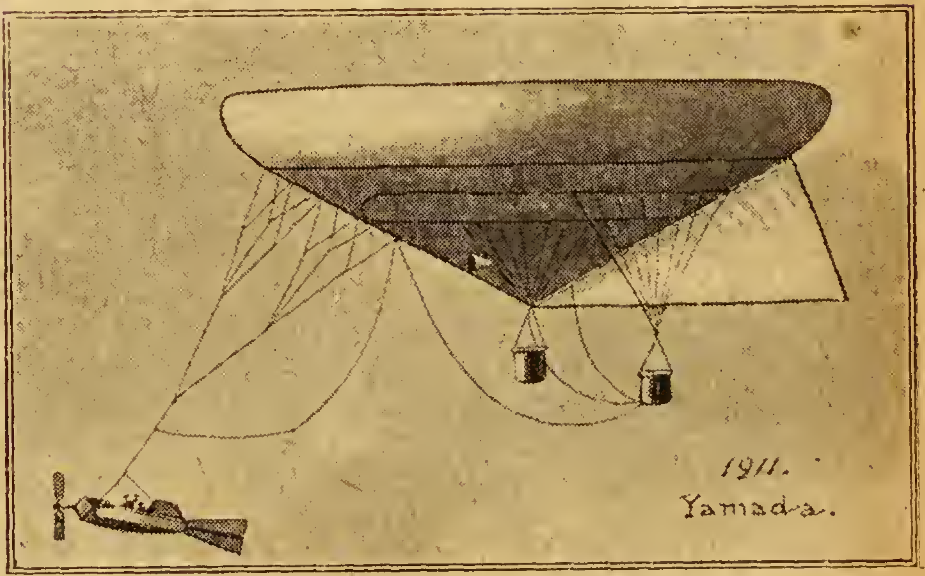


France, as well as Great Britain, tried her hand at the rigid type of airship, and in 1912 the "Spiess" (Zodiac Co.) made its reception tests for the French Government. Although on the same general lines as the Zeppelin, the "Spiess" differed considerably in construction. The main framework consisted of hollow-wood formers bound with fabric, upon which was built up a lattice work of aluminium. the whole being extensively braced with steel wire. There were 14 sides to the polygon and about 14 compartments containing a gas bag. There were two gondolas mounted below the hull and connected by a "cat-walk" as in the Zeppelin. In the first model the front gondola only contained a motor, a 200 h.p. Chenu, driving side propellers mounted on the hull, but in 1913, in addition to other modifications, a second motor, of the same power, was added to the rear gondola. Trials were still being carried out at the outbreak of hostilities.



A rather interesting type of semi-rigid airship, the "Veeh," somewhat similar to the Forlanini, was experimented with in Germany during 1911 and 1912. This had a torpedo-shaped envelope attached to a rigid keel extending from point to point. This keel was built up of steel tubes in the form of a girder, rectangular in section, and constituted an enclosed passageway extending for a greater part of the length of the ship, a pilot's cabin being formed in the front portion. Two engines were located in the keel, one forward and one aft, each driving a port and starboard propeller carried by a rigid framework mounted on the keel. The control planes were also attached to the keel.

Before concluding this *résumé* on "Airship Pioneers," mention should be made of an effort hailing from the Far East—the design of Isaburo Yamada, in Japan. His original design of 1909, as shown in one of the accompanying illustrations, was, practically speaking, a kite balloon rendered mobile by means of an aerial motor boat. The arrangement, though ingenious, does not appear to be at all practical, and it is doutbful if any successful results were obtained. As a captive kite balloon, however, some very good work was done at Port Arthur during the Russo-Japanese War. It should be pointed out here, that whereas the Parseval kite balloon was already in existence at that time, the Yamada balloon, although having a similar air-ballonet arrangement, was in reality an original Japanese idea. For hundreds of years in Japan, May 5th has been the occasion of "The Boys' Festival," when large paper or silk balloons in the form of a carp, suspended on poles, were the emblem of the day. The mouth of the carp was open, and air forced in by the wind inflated the body and slowly escaped out through a small opening in the tail. Thus was the body of the carp kept always inflated, and the fish floated gaily in the air. The same idea is carried out in the kite balloon, air entering a chamber immediately below the gas envelope through a comparatively large aperture in front and slowly escaping through a smaller air vent at the rear. It will be seen that the Yamada balloon had a large triangular sail below the rear of the envelope, the purpose of which was to act as a steadying fin or rudder. In 1911 the Yamada airship appeared in another form. The envelope retained its main characteristics, but a conventional triangular-section *nacelle* was suspended below, in which was installed a 40 to 50 h.p. Korting engine.



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Medals for the R.F.C.

In the long list of non-commissioned officers and men to whom His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field announced in the *London Gazette* of November 12th, the following appears :—

28666 2nd Class Air Mech. F. Dean, R.F.C.

In the list of awards of the Meritorious Service Medal in recognition of valuable services rendered with the armies in the field during the present war, the following appear :—

4310 Corpl. G. D. Bell, R.F.C.
348 Flight Sergt. H. E. Bethell, R.F.C.
605 Sergt.-Major G. Felstead, R.F.C.
1112 Actg. Sergt.-Maj. J. Fulton, R.F.C.
1178 Flight Sergt. (A. S.-M.) J. R. Gardiner, R.F.C.
1498 Flight Sergt. S. R. Goldthorpe, R.F.C.
1711 Corpl. G. Green, F.R.C.
136 Flight Sergt. H. Green, R.F.C.
1025 Fight Sergt. A. Hawley, R.F.C.
718 Flight Sergt. F. J. Hellyer, R.F.C.
780 Sergt. G. W. Hepple, R.F.C.
2057 Sergt. H. E. Hunt, R.F.C.
607 Corpl. T. Hyland, R.F.C.
4999 Actg. S.-Maj. A. Knight, R.F.C.
3599 Actg. S.-Maj. W. G. Mantell, R.F.C.
2988 Actg. S.-Maj. E. Meynell, Hdqrs., R.F.C.
8347 Actg.-S.-Maj. E. R. Millington, R.F.C.
217 Flight Sergt. D. H. Newton, R.F.C.
1027 Actg. S.-Maj. C. Rapley, R.F.C.
5853 1st Class Air Mech. S. Shearing, R.F.C.
4865 Corpl. V. E. Wansbury, R.F.C.
2862 Corpl. R. S. Weaver, R.F.C.
198 Serg.-Maj. F. Whilton, R.F.C.
1071 Flight Sergt. E. R Wood, R.F.C.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.
Total subscriptions received to Nov. 7th, 1916	10,887	0	5
Collected at the Westland Aircraft Works, Yeovil (Fifty-fifth contribution)	0	13	7
Collected at the Westland Aircraft Works, Yeovil (Fifty-sixth contribution)	0	15	1
Staff and Workers of Gwynnes, Ltd. (Twenty-seventh contribution)	8	13	3
Total, November 14th, 1916 ..	10,897	2	4

B. STEVENSON, Assistant Secretary.

166, Piccadilly, W.

The Car.

No. 3, Clifford Street, New Bond Street, W. The new premises of the Royal Aero Club which will be opened in December.

Another Long-Distance Flight.

The Balkans theatre is providing several records in the way of long-distance flights. According to a message from Petrograd on November 8th a British pilot had arrived at Reni, in the Dobrudja, having flown from the Greek Islands, near the Bosphorus.

A Height Record.

Messages from Turin on November 10th stated that Flight-Lieut. Guidi had attained a height of 7,950 metres (26,082 ft.), which is claimed as a world's height record. The Germans claim that Oelerich in July, 1914, reached a height of 8,150 metres, but this has never been authenticated.

Fatal Accidents.

While flying near Marlborough on November 8th Capt. R. Bentham, Manchester Regiment, met with a fatal accident. The machine, when at 2,000 ft., entered a storm cloud, when the engine stopped and the machine turned over and over. Just before reaching the ground the engine restarted, and the machine, righting itself, commenced to climb. The engine stopped again and the machine crashed to the ground. A verdict of "Accidental Death" was returned at the inquest on November 10th.

Second Lieut. J. A. Davey, R.F.C., was also killed on November 8th. After flying for about 400 yards his machine appeared to be uncontrolled and dived into a shed. The pilot was found with a fractured skull and severe burns.

Second Lieut. H. E. Byers, Duke of Cornwall's Light Infantry, attached R.F.C., was flying on November 12th, when his machine fell from 3,500 ft. and he was killed. At the inquest on the following day a verdict of "Accidental Death" was returned.

Second Lieut. L. H. W. McKisack, Lancers and R.F.C., was killed while making a flight on an aeroplane on November 13th. At the inquest Lieutenant K. C. MacCallum said the deceased officer was making his first solo flight. He flew one circuit in a normal manner, and on completing the second circuit put on too much bank and apparently not enough rudder, which caused the machine to side-slip, and it fell from about a height of 25 ft. The machine was a total wreck. A verdict of "Accidental Death" was returned.

An Aeroplane in a Main Street.

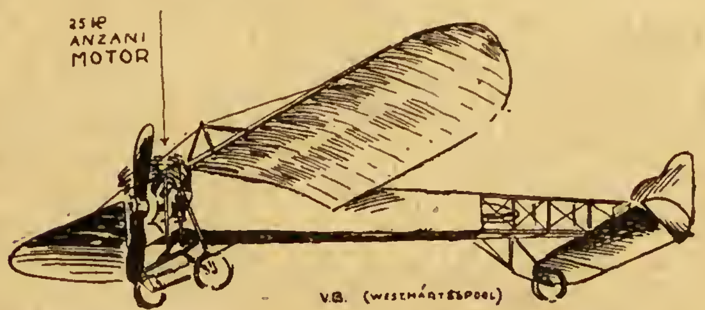
Forced to come down, the pilot of an aeroplane tried to land in the main street of Felling, Gateshead-on-Tyne, but the machine caught a lamp-post and crashed to the ground. An elderly passerby, Robert Brewis, was injured and died from pneumonia supervening on the injuries. The jury exonerated the pilot.

Answers to Correspondents.

If in doubt about anything aviatic, write to "Flight" *about it.*

V. B. (West Hartlepool).

The height above them to which objects such as buildings, trees, &c., affect the air varies very considerably, both according to the height, shape and general location of the objects and according to the velocity of the wind, and no general data are available on the subject. Certainly the effect of such objects is felt at a height of occasionally several hundred feet, in the form of air currents, "bumps," or whatever pet names pilots have for the various disturbances, although they could hardly be considered, as you suggest, dangerous. Generally speaking, there is no reason to suppose that the air is calmer over the sea than over land. What gives the impression that it is calmer over the sea is the fact that as a rule the wind at a considerable distance from land is much steadier, although not necessarily of smaller velocity, than over the land. Your last question is not quite clear. You say M. Blériot's first flight, but we presume that you mean the cross-Channel flight, which was not, as a matter of fact, by any means his first flight, nor yet his longest, although it made him famous the world over. The cross-Channel flight took place on July 25th, 1909, M. Blériot starting from Les Baraques, near Calais, and landing at Northfall Meadow, near Dover, the distance being about 31 miles and occupying about 40 minutes. During the crossing M. Blériot flew at an altitude of 150 to 300 ft.



R. S. (Kingston).

According to tests at the N.P.L., the resistance of an aeroplane wheel of 26 ins. diameter is 2·4 lbs. at 70 m.p.h. The wheel in question was of the disc type, and was dissymmetrical, having its hub slightly off-set laterally. For purposes of calculation it will be found sufficiently accurate to assume that the resistance increases as the square of the speed. Slightly different results will, of course, be obtained with symmetrical and more so with open wheels, but the figure stated may be taken as a fair approximation. Regarding the idea you have, you can send drawings to the Ministry of Munitions, Inventions Department, Princes Street, Westminster. But why not try to get in touch with a private firm of aeroplane constructors, with a view of getting them to take it up on a royalty basis?

J. E. N. (Hammersmith).

An aeroplane flying against or with the wind will have its *ground speed* correspondingly reduced or increased. Thus, for instance, if the speed of a machine is 100 m.p.h. in still air and it is heading into a wind of 40 m.p.h., its ground speed will be 60 m.p.h., or if the same machine is flying in a following wind of 40 m.p.h. its ground speed will be 140 m.p.h. We do not know of any reliable instrument that will indicate accurately the ground speed of an aeroplane, although several suggestions for such an instrument have been made. What is indicated on all naval and military aeroplanes is the air speed, which is indicated by a Pitot and Static pressure tube, but this does not of course take into account the velocity of the wind in which the machine is flying. If an aeroplane is not flying directly into or with a wind, but has the wind on the side, it will not reach the destination towards which it is apparently pointing on account of drift. In order to indicate to the pilot the amount of drift, which depends upon the relative velocities of the wind and the machine, and on the angle between the wind and the course of the aeroplane, instruments have been designed which, working in conjunction with the compass, indicate to the pilot how many degrees to allow for drift.

A. W. (Sutton-on-Trent).

We do not know of any special method of applying the dope to get the results you mention. Possibly in attaching the fabric you could make allowance for the difference in tightening up, putting it on very tight in the direction in which you wish it to pull up tight, while leaving it rather loose in the other direction.

D. D. C. (East Sheen) and **H. S.** (Hants.).

"Aeroplane Design," by F. S. Barnwell, 2*s.* 6*d.* net, and "The Design of Aeroplanes," by A. W. Judge, 9*s.* net. Both can be supplied from the offices of "Flight" at these prices plus postage.

A. H. P. (Oakleigh Park).

The forward gondola in the latest type Zeppelin measures some 45 ft. in length and is about 8 ft. deep. As to the space occupied in this car by the engine, we refer you to our recent description of the "L. 33" in "Flight."

R. H. W. (Ramsgate).

F.B.A. stands for the initials of Franco-British Aviation, the company which took up the manufacture of the Donnet-Leveque flying boat.

A. V. H. (Maida Vale).

The society you require is the Aeronautical Society, 11, Adam Street, Adelphi, W.C.

E. L. (Barnsley).

Generally speaking where the eyesight is so bad that glasses are necessary it would be a bar to the granting of a commission as a flying officer. With regard to wireless you should address your inquiry to the Regent Street Polytechnic, London, W.

A. B. C. (Worcester).

Apply to the Officer Commanding, R.F.C. Depôt, Farnborough.

J. F. A. (Scarborough).

Apply to the Admiralty for the proper forms, and on filling them up send them to the Director of Air Services, Admiralty, S.W. For particulars of the R.F.C. Cadets Battalion apply to Adastral House, E.C.

S. L. M. (Norbury).

You do not say whether you wish to obtain a commission or to enlist. If the former see reply to J.F.A.

G. R. C. (South Bank).

Yes, an "ordinary civilian" can join the R.F.C. or R.N.A.S. If he is granted a commission and is considered suitable he will be taught to fly.

A. B. C. (Cheltenham),

Yes. A cadet from the R.F.C. Cadet Corps is granted a "regular" commission if considered suitable. The pay of R.F.C. officers was set out in our issue of November 9th on page 984.

R. W. G. (Golder's Green).

The possession of a R.Ae. Club pilot's certificate does not entitle one to a commission. The "wings" in the R.F.C. are only granted after carrying out a series of tests a good deal more difficult than those for the ordinary R.Ae.C. certificate. There seems to be some uncertainty as to whether the grant is now being made; you should apply to Adastral House for information.

W. G. M. (Edinburgh).

See reply to R.W.G. above. Apply to the headquarters of the R.F.C., Adastral House, London, E.C., for the requisite forms, and send them, when filled up, to the Director-General of Military Aeronautics, Adastral House, E.C. The replies to the two specific questions are:—1. Apply for your commission first. 2. No.

H. W. B. (Southfields).

See reply to J.F.A.

B. P.

The best compression gauge we know for the purpose you mention is the "Okill," made by Taylor's (Brass Founders), Ltd., All Saints' Street, Bolton, Lancs.

ARMCHAIR REFLECTIONS

by the "Dreamer"

HE must have curtailment of soul, or a shrivelling understanding, who can read of that mighty aerial battle on the Somme and not feel the blood course at increased speed through his arteries. Oh, that some photographer, braving the flying bullets, may have taken a film of it, even though at a great distance! For it is something new in warfare, something of which most of this generation failed to dream of as a possibility, only a decade ago.

Ten years ago the conquest of the air was progressing slowly, but ten years ago the picture of 70 or so aeroplanes meeting in bloody battle over but a few square miles of country, and only a few thousand feet in the air, that all at hand might view, was so fantastic as to be beyond the witchery of ordinary brains to visualise.

Yet now that it has happened, it needs no gazing into crystal globe to magnetise the imagination into condition of subtle, physical sensibility, endowing power to reconstruct even from the meagre reports available, a picture true in substance and potential in fact. Passively receptive of impressions, I have but to close my eyes to have a delineation of the evolutions conveyed to me equivalent to the visions of a camera-obscura. Above me is the blue dome of heaven, itself desecrated by mundane progress in that its ether must respond to the crackling of wireless telegraphy, conveying by and through its ethereal body, messages of prospective death.

Around me, so far as eye can reach, the earth is torn and scarred as by the upheaval of some mighty subterranean agitation. Ditches and conduits, hollows and trenches, a disturbment of the whole topsoil and subsoil as though the plough of a modern Goliath had passed that way bent on the refiguration of the landscape. Pre-existing woods and forests are now but as a garnered cornfield, their timberous stubble standing gaunt and desolate. Hills have been swept away in their entirety; valleys exist where before there were none. The horizon is broken by silhouetted ruined churches and homesteads. And in all that vast panorama, not one living soul of all those responsible for this casting down of the beautiful in Nature and the glories of man's handiwork in his sane moments, can be seen.

Incessantly, apparently from out the bowels of the earth, there leap flashes of fire and smoke. The ground trembles at the shock, the air tremors deal staggering blows, the roar is thundrous in its reverberations. At intervals, kite balloons are maintaining their positions, slowly swaying from side to side in the breeze, their occupants, sole visible presence of humanity, keeping keen observation.

Wireless vibrates abroad the information, telephones voice the news, a whole fleet of enemy aeroplanes are speeding in our direction. Swift from the ground our machines leap into the air to give battle, meeting their opponents a mile or so before our lines. Not with any exhilarating clash of battle do these antagonists meet in mid-air, but silently except for the insistent hum of engines, they circle and swoop and manœuvre like giant seagulls, the smoke from exhausts tracing fantastic curves and figures in the air. Muffled poppings reach the ear, at times like the distant rolling of drums. Sometimes they are in staccato, sometimes in bursts, as the pilots scheme for positions enabling their gunners to get home with their weapons.

A Fokker is the first to get into difficulties. After a close operation in which the two machines appeared to revolve around in close proximity to a common axis, she veers away at an alarming angle, which suddenly increases to a headlong dive, belching flames and smoke as she crashes down, mercifully beyond our vision. Here is a British biplane which is set about by three of the enemy. It is fearsome odds, yet she fights on until like a winged partridge she flutters away, making giddy dives, recovering to sideslip first to port and then to starboard. A dive, she is gone. No, by almost a superhuman effort her pilot has flattened out to some extent and attempts a landing wing down. She lands at a terrific speed, runs a little way, and turns bodily over with a sickening crash.

Above the fight goes on. Again a machine is fluttering back somehow to friendly lines, there one is falling like a dead leaf, and all the time that incessant popping. Right in the foreground is one of our machines that has not fired a shot for possibly a few minutes—it seems 30 to the watchers—but is apparently doing all it can to get away from the remorseless two that beset it. Afraid? No. A gunner beyond the power to fire another shot, and two enemy gunners mercilessly emptying drum after drum into one that cannot reply. Suddenly, head down as straight as ever fell rocket stick she goes, engine full out. Seconds only, and her enemies are left far above, their duty done.

But not to pile up below. Once clear, her pilot flattens gently out, and returns to earth with his gruesome burden. It was but an evolution to get clear when put out of action.

Brave riders of the air, who fight at fearful altitudes without one thought of the space beneath you, intent only on doing your duty. Brave mothers and wives who patiently wait at home to conjure up in your minds pictures such as the foregoing.

Death. Ah, yes, I know there must be death. It seems an unwritten law in this chequered existence which we call life, that no one person can have pleasure except at the cost of sorrow to others. It seems, sometimes, that it were almost impossible for one to live, except by the death of another. Yet Kin of yours, and Kith of mine, not one of our lost ones but have done far more good in dying for England, that they could ever have done by living.

AVIATION IN PARLIAMENT.

Co-ordination of the Air Services.

SIR EDWIN CORNWALL, in the House of Commons on November 7th, asked whether the War Council have given full and special consideration to the question of the best means of co-ordinating, organising, and developing the Air Services, or whether the matter is left to the War Office, Admiralty, and Munitions Department to adopt whatever policy they individually may prefer ?

The Prime Minister : The functions of the existing Air Board were explained to the House in May last by the then Under-Secretary of State for War and by my right hon. friend the Secretary of State for the Colonies, and included the task of organising and co-ordinating the supply of material for the two Air Services. His Majesty's Government have just received the first Report of the President of the Air Board, and it is receiving their most careful consideration.

Mr. Ashley : When will the decision of the Government be announced, as there is great feeling in the country about this matter ?

The Prime Minister : Very soon.

Mr. Joynson-Hicks, on November 8th, asked the Prime Minister whether the time has come to confer further powers of an executive character on the Air Board, as foreshadowed at the time of its formation ?

The Prime Minister : I would refer the hon. member to my reply yesterday to a question on the same subject. The Government has just received the first Report of the President of the Air Board, in which certain suggestions and recommendations are made, which are receiving our most careful consideration.

Major Hunt : Is the right hon. gentleman aware that the Air Board will not go on unless it has full power ?

Mr. Joynson-Hicks : May I ask whether the Report has not been in nearly three weeks now, and whether he can expedite its consideration ? It is very important.

The Prime Minister : No one is more alive to that than I am.

Mr. Billing asked the Prime Minister whether, in view of Lord Curzon's recent Report on the Air Service, thereby substantiating the prediction of the member for East Herts, he will consider the Paper dealing with the creation of an Air Ministry and an Imperial Air Service handed to him by that member on April 12th ?

Mr. Bonar Law : Lord Curzon's Report is a confidential document, and I cannot accept the hon. member's description of it. The whole subject is being fully considered.

Mr. Billing : Would the right hon. gentleman mind inquiring whether the Paper which I handed to the Prime Minister personally has been considered, and whether, if it has not, it is going to be considered ?

Mr. Bonar Law : I have no doubt that it received the consideration which it deserved.

Mr. Lynch : May I ask whether it is not a fact that the chances of the Allies in this war are being injured by putting up such a wretched organisation as the Air Board, and whether it is not time that this question was grappled with in some masculine spirit ?

Mr. Bonar Law : That must be a matter of opinion, and I am not prepared to express one just now.

Compensation for Air Raid Victims.

MR. HOGGE asked the Prime Minister whether he will refer the cases of persons killed in this country as the result of Zeppelin raids to a new Select Committee with a view to some compensation being given, especially to widows deprived of their husbands ?

Sir E. Cornwall asked whether the Government is reconsidering the question of losses sustained by Zeppelin raids ; and whether, at an early date, all such losses, both as regards property and persons, will be made a national liability ?

The Prime Minister : The Government have this suggestion under consideration, but I cannot yet make a statement on the subject.

Sir E. Cornwall : Is the right hon. gentleman aware of the strong and growing feeling in the country in favour of some change of policy in regard to these matters ?

The Prime Minister : Does the hon. gentleman mean in regard to loss of life ?

Sir E. Cornwall : Both property and life.

Prize Bounties Suggested.

MR. DENNISS asked the Prime Minister whether he will initiate legislation to put the aircraft and anti-aircraft services so far as attacks on Zeppelins are concerned in an analogous position to that of the Royal Navy as regards prize bounties ?

The Prime Minister : This suggestion is worthy of consideration, and will receive it.

The Anti-Aircraft Insurance Funds.

SIR E. CORNWALL asked the Chancellor of the Exchequer how much money is in the hands of the Government from anti-aircraft insurance ; and when he will publish a balance sheet and profit and loss account ?

The President of the Board of Trade (Mr. Runciman) : I do not think that it would be in the public interest to publish any financial statement regarding the Government Aircraft Insurance Scheme at present.

Warnings of Air Raids.

SIR J. LONSDALE asked the Secretary of State for the Home Department if it has now been decided to give public warning of the approach of hostile aircraft ; and, if so, will he state the nature of the arrangements that have been made ?

Mr. Samuel : Arrangements have been made by which theatres, music halls, cinemas, &c., will, if desired, be warned of an apprehended air raid, in order to afford an opportunity for the audience to disperse. For reasons which have already been explained to the House, it is not proposed to give a general public warning in the London area.

Zeppelin Raids (Risk of Fire).

MR. BILLING, on November 9th, asked the Secretary of State for War whether he is aware that the risk of fire has been increased in many localities as the result of Zeppelin raids ; and, seeing that expert firemen not engaged in certified occupations are now being called up, whether he will consider the advisability of exempting a sufficient number of expert firemen in those towns and villages which have no regular brigade and are in the direct track of Zeppelin raids ?

Mr. Forster : That a new cause of risk of fire has arisen by the dropping of explosives from Zeppelin airships has not passed unobserved by either the military or civil authorities concerned. These authorities have discussed the question, and arrangements have been made in the direction suggested by the hon. member.

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Bombing a Railway Bridge.

AN Exchange message from Athens states that on November 9th two Greek and two Allied aeroplanes co-operated in wrecking the bridge over the Anguista, near Boya. The driver of a train filled with Bulgarian soldiers failed to see the damage in time and the train dashed into the river.

Germany's Apology to Holland.

As was expected, Germany has again apologised to Holland for the straying of a Zeppelin, and also for shedding sundry articles. According to the German Chargé d'Affaires at The Hague, Main Headquarters state that the Zeppelin in question was an army airship, which, owing to a defect in the motors and steering gear, was obliged to throw overboard two petrol-tanks. The commander, who had apparently quite lost his bearings, reported that the incident had occurred over Belgian territory. Main Headquarters, the Attaché added, would have offered its apologies sooner if it had known earlier that the airship had flown over Dutch territory.

Germany Looking Ahead.

IN an article discussing General Groner's appointment, and urging the German workmen to do their utmost, the *Dusseldorfer Generalanzeiger* concludes as follows :—The English have overtaken our original superiority in artillery, and it is worthy of notice that they are now engaged in constructing airships to approach or even overtake our advantage in this region also."

AIRISMS FROM THE FOUR WINDS

In the South Kensington Museum, Science Section, there are on exhibition several models of aeroplanes and gliders, besides a scale model of a Zeppelin of the Schwaben type; and for those interested in research work, but who have been unable to manage an inspection of the wind tunnels used at the N.P.L. at Teddington, a model of a wind tunnel is in evidence. Although the Museum is nominally closed to the public, those seriously interested in aviation will, we believe, find no difficulty in gaining admission on application to the custodians of the Museum.

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An exhibition of war photographs at the Pavillon de Marsan, rue de Tivoli, Paris, is causing great interest. A conspicuous portion of the exhibition is formed by the collection of unique photographs taken by *l'Aeronautique Militaire.* Would it not be a good idea if our own authorities were to place on exhibition somewhere in London a selection of the photographs of the Front taken by our R.F.C. Observers? If a small entrance fee were charged and the proceeds devoted to the purchase of comforts—of which our flying men will be sorely in need now with the winter upon them—a great deal of good might result.

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Although reports of the deeds of the military aviators of our brilliant French Allies reach us daily, comparatively little is heard of the good work done by the naval section of the French Air Forces. It should not, from this scarcity of news, be concluded that little is being accomplished by French naval airmen. Since a considerable number of French naval pilots are coming in for their share of honours, the list of them would be too long to publish in full, and when we choose to mention one out of the long list it is because he is well known to "Flight" readers. We are referring to Pilote Aviateur Levasseur, who will be remembered as a brilliant pilot of Nieuport seaplanes. For exceptional services rendered in naval aviation M. Levasseur has been awarded the Medaille Militaire.

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Aviation in neutral countries is progressing apace. In Norway they are building M. Farmans at the rate of two a week, while at the Thulin works in Sweden, Moranes are being constructed. In Denmark the Army have purchased some Morane monoplanes, and are building Nieuport chasers and Vickers gun 'buses under licence. The Danish Navy is concentrating on seaplanes, of which several F.B.A.'s were purchased early in the war. These were not found particularly suitable, having a tendency to shed their wings in mid-air, and the Navy are now building an improved type with two engines. The motors mostly used are Curtiss, with a few Mercedes transferred from interned German seaplanes. Quite a common-sense idea that.

The Parliamentary Air Committee follow the smoke-trail from the House yard to the Aircraft Company's works, &c., on a visit of inspection last week.

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It seems evident that the German naval people have got the wind up, and are fairly on the jump all the time, for we learn that a request was sent by the commander of a destroyer flotilla to the Danish pilots not to practise night flying over the portion of the Sound where the destroyers were patrolling, as they might otherwise be mistaken for English aircraft and potted at by the nervous crews.

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Liebknecht having been put safely under lock and key by the German autocratic rulers for having told the German nation some unpalatable truths, his successor, as representative in the Reichstag of one of the districts of Berlin, it is proposed should be Count Zeppelin.

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A team of the R.F.C. had a bout with the police at Richmond last week, but it was nothing more serious than a football match, the Solicitor-General, who was accompanied by Lady Cave, kicking off for the contest.

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Good results should accrue to the cause from the work of the Parliamentary Air Committee, as it appears to be obtaining more adherents as it goes along. Moreover, the wide support given is of an enlightened character and not of the order which Mr. Justice Darling satirised in Court the other day when he remarked: "My slight studies in Parliamentary procedure lead me to think that if you can convince one man certain others will follow. I believe shepherds have noticed something similar."

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The attraction of the annual November 9th procession from the Mansion House to Charing Cross, back to the City *via* the Law Courts and Thames Embankment—judging by the cheering—was the British aeroplane, the captured German aeroplane and gun, and the R.N.A.S. and R.F.C. boys. The procession also included the new Lord Mayor, who was "Dunn" both at the start and finish.

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Hard fighting is being put in and great sacrifices made by the Germans in Roumania to obtain command of the great Danube bridge at Czernavoda, which seems strange, in face of their claim at the start of the Roumanian activities of having entirely destroyed this highly important link by means of bombs from Zeppelins. Perhaps, as their veracity is such an axiom amongst nations, they hoped our new Allies would accept their statement without question and not bother to look for themselves and so give them easy passage.

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Officer: "What arrangements have you made in case Zeppelins come?"

Sergeant: "If any bombs are dropped on the 'uts, sir, the camp will be roused by three blasts on a whistle."—*Punch.*

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No wonder the price of glass is going up by leaps and bounds. According to a London Borough Council report, after the recent Zeppelin raid 14 tons of broken glass were swept up from the streets.

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According to the *Horological Journal*, among the relics saved from one of the Zeppelins recently destroyed in this country was the commander's gold watch. It was considerably damaged, but the engraved inscription within the outer case remained, and read "Made in England." Sounds a bit ironical, but perhaps, after all, the commander only came over to have his watch overhauled.

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The recommendations in the Air Board's report are, according to Mr. Asquith, "receiving careful consideration." He must get a move on soon, as there are sanguine folk around who look to the war being over now in a couple of years.

Anyway, it is pretty certain the Board will not see it through without the asked-for extension of powers is pretty promptly granted.

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Flight-Commander Albert Ball, whose very remarkable exploits were recently published in Flight, is to be presented with the honorary freedom of the City of Nottingham, of which he is a native. The honour is the more appropriate as his father has filled the Mayoral chair.

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The idea of Prize Bounties for the Aircraft Services, upon similar lines to the Royal Navy, is catching on. Even to Mr. Asquith's official mind it is a suggestion worthy of consideration, and will receive it. Which, we hope, carries with it a different construction to the intended meaning in an answer to another M.P.'s question, viz., that *his* suggestions had no doubt "received the attention they deserved."

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In the Prize Court last week one of the methods of protecting German mine-layers, whilst engaged in their hazardous duties, emerged. It was over a bounty claim by a British Squadron for the destruction of the German mine-layer "Meteor." As a fact the latter had been blown up by its German crew, when they found escape from the squadron impossible, they taking refuge in a Swedish vessel near by. The denouement was the result of the British squadron having been kept under observation by German airships all the time and its movements communicated to the "Meteor," so that when all escape was barred the latter was able to commit Hara-Kiri. £655 was awarded.

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What a commentary upon the bulldogism of our air pilots is their record in the now historical mid-air fight of last week. In the descriptions emanating from all quarters the same note is struck, and undeubtedly brave as are their German opponents in the air, the palm for calm self-confidence and superiority in meeting the German aircraft remains with our R.F.C. men. Possibly no more incisive summary of the *sang froid* displayed by the units of our thirty machine phalanx could be evolved than the final clause of an article from the correspondent of the Havas agency at Amiens. His considered tribute to our flyers is that "The British airmen, who regarded the fight as merely an incident of their journey, continued their way to the invaded territory, and after having attained their objective returned to their lines." Truly a tabloid summary of the methods in the British Army.

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal*) *of November*, 1906. "Flight" *was founded in* 1908.

A "Hill Climb" for Balloons.

A novel event is being organised in the United States, in which balloons are to compete against motor cars in a "hill climb" up Mount Washington, in the White Mountains. The balloons and motor cars are to start from the bottom of the mountain, and the competitor who first touches a house at the summit is to receive a prize of $1,000, those who arrive subsequently getting smaller amounts. If the wind is exactly the right way it is probable that the balloons will win in a canter (if one can imagine balloons in a canter), but if the wind is in any other direction, we fear it will be impossible to induce the balloons to face the ordeal.

M. Santos Dumont affords Hospitality to the Blériot Machine.

A strangely designed flying machine, which we have illustrated in our pages, designed by M. Blériot, who has been experimenting with it on the Lake D'Enghien, has gone on a visit to M. Santos Dumont. M. Blériot has come to the conclusion it would be much better to mount it on wheels and experiment in the way that M. Dumont does, and as he has no place available for the purpose, he wrote to M. Santos Dumont to ask if he would allow him to use his aerodrome at Neuilly. M. Santos Dumont, who is very generous and not at all jealous of other inventors, at once agreed, and the next experiments with the Blériot machine will accordingly, it is to be presumed, also take place at Neuilly.

The "Ville de Paris" Airship.

M. Deutsch's great airship, the "Ville de Paris," made its first serious attempt at flight on Sunday last, and with the worst of luck. Starting from the shed at Sartrouville at half-past ten in the morning with four passengers up, and M. Surcouf in command, it crossed the Seine moving very satisfactorily, till when above the Forest of St. Germain the guide-rope caught in a tree. The aeronauts tugged away at it manfully till they succeeded in pulling it loose, but the result was apparently to confer upon the great airship the dangerous buck-jumping movement, which, when once started, is so difficult to get over, and it became absolutely unmanageable. Making a wild swoop downwards it crashed through the tops of the trees, tearing off branches and of course injuring itself in the process. Finally it came to earth in a large cabbage field about 12 o'clock midday, where it was subjected to further damage from the high wind blowing, which, of course, forced the gas-vessel over towards the ground, and interfered with the process of deflating it.

M. Santos Dumont and the Deutsch-Archdeacon Prize.

Even last week M. Santos Dumont evidently felt confident of being able to maintain his machine in the air for a considerable time, for he went to the Aero Club and formally entered himself for a trial for the Deutsch-Archdeacon Prize in accordance with the rules, selecting two days—Friday and Saturday last—for making the attempt, paying his entrance fee of 50 francs per day. He selected Bagatelle as the scene for the attempt, but unfortunately the Superintendent of the Bois de Boulogne was afraid that too large a crowd would gather, and the trial was accordingly postponed.

M. Santos Dumont Achieves a Record.

On Monday, however, M. Santos Dumont did conduct a series of experiments, and achieved a triumph which, as far as actual accomplishment is concerned, may be regarded as having thrown his prior achievements into the shade, for he actually maintained an equal and uniform flight for a distance of 220 metres (practically 240 yards) without touching the ground, 6 metres, or nearly 20 ft., above it, and travelling at —and that, perhaps, is as important a point as any—the comparatively low speed, under such circumstances, of about 25 miles per hour.

M. Dumont appeared to have the aeroplane fully under control, and had not the presence of a batch of interested spectators straight in the path he was pursuing considerably shaken his nerve for a moment, there is every reason to believe that he would have remained considerably longer in the air, and perhaps even have succeeded in turning round and recovering his starting-point.

By his performance of Monday, M. Santos Dumont was the winner of two prizes, one for 100 francs for the first aeroplane to fly over 60 metres, and another of 1,500 francs for the first to cover not less than 100 metres without touching the ground. M. Santos Dumont states that he intends to divide both the prizes amongst his three assistant mechanics.

Navigable Airship Race, 1908.

Our contemporary, *Le Matin*, is proposing to organise for 1908 an open event for airships of the navigable balloon type, to be held from Paris to London, £10,000 being already offered for prizes. Of this amount £4,000 is being offered by the *Matin* and £2,000 each by the Marquis De Dion, M. Charley and M. Clement.

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AN ECHO OF "L.15."—One of the 353 gold medals given by the late Lord Mayor, Sir Charles Cheers Wakefield, to General Headquarters, Home Forces, for distribution to that number of officers and men who were concerned *in* the defensive arrangements when "L.15" was brought down.

Personals.

Casualties.

Second Lieutenant ALAN VICTOR CAIN, Hampshire Regiment, who was killed on October 18th, aged 24, was the younger son of Mr. H. F. Cain, of Hove, Sussex, and Staple Inn, London. Educated at Herne Bay College, he became in 1913 a Professional Associate of the Surveyors' Institution, and held an appointment under the Hampshire County Council at the Castle, Winchester. Immediately after the outbreak of the war he enlisted in the Hampshire Carabiniers, and served with them until February, 1915, when he received a commission in the Special Reserve of Officers. He fought in Gallipoli, and while there served as an observer in the R.N.A.S. He was subsequently invalided home. From July last until he fell he served at the front with the Hampshire Regiment.

Lieutenant EDWARD MERVYN CARRÉ, R.F.C., who was killed on October 16th, aged 22, was the youngest son of the Rev. Arthur A. Carré and Mrs. Carré, of the Rectory, Smarden, Kent. Educated at Christ's Hospital from 1903 to 1910, he left as Deputy Grecian and entered the College of the Resurrection, Mirfield, and in 1912 matriculated at Leeds University, whence he obtained an Honour Degree in Classics. On the outbreak of war he joined the Artists' Rifles and served abroad, receiving a commission in the Lincolnshire Regiment in March, 1915. Being promoted lieutenant, he was transferred to the Royal Flying Corps in May last. His eldest brother, Maurice Tennant Carré, Australian Infantry, was killed at Lone Pine on September 2nd, 1915. Two remaining brothers, Captain M. H. Carré, M.C., and Second Lieutenant G. T. Carré, are serving in the Royal West Kent Regiment, and have both been twice wounded.

Second Lieutenant JOHN A. DAVY, R.F.C., aged 18, who on the 8th inst., at Didcot, Berks, was killed as the result of an accident whilst flying, was the only son of John H. H. Davy, of "Nathalia," 15, West Hill Road, East Putney.

Lieutenant GEORGE EDWARD GILES, R.F.C. (killed whilst flying on duty on November 11th), was only son of Major and Mrs. G. D. Giles, of Douglas Lodge, Newmarket, and grandson of the late Mr. George Barclay, of Coates Crescent, Edinburgh. At the time of the accident that caused his death he was pilot of the machine. He had his Army rank of Lieutenant in August last year, and was gazetted Assistant Equipment Officer, Royal Flying Corps, in June.

Flight Sub-Lieutenant WILLIAM STEWART STEWART, R.N.A.S., elder son of the late J. F. Tarratt and Mrs. Henry Rogers, of Ellary, Argyllshire, aged 19, was killed on November 8th as the result of an accident while flying on duty.

Missing.

Lord LUCAS, Yeomanry and R.F.C., at one time a Cabinet Minister, who became an officer in the R.F.C., was last week reported missing. He was serving with the R.F.C. in France, and made a flight over the German lines the previous Saturday. He did not return from this flight, and so far nothing has been heard of him or his machine. Lord Lucas was wounded during the South African War, in which he was acting as a correspondent of the *Times*. As a result of his wounds his leg had to be amputated below the knee. During the first few months of the present war, when a member of the Cabinet, he held the office of President of the Board of Agriculture. On the formation of the Coalition in May of last year, he was one of the Ministers who retired. He immediately gave up political work and joined the Royal Flying Corps, although over the standard age (for this branch of the service) of 30. He soon gained his pilot's certificate and was sent to Egypt, where he did a good deal of flying. After a time he came back

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A batch of pupils who have recently taken their Royal Aero Club pilot's certificates at the Hall School, Hendon.—(1) Sergt. G. W. Cottrell-Jones, Messrs. (2) F. J. Clegg, (3) J. G. Cowell, (4) J. Cordner, (5) Douglas Stamps, (6) P. C. Rayne, (7) Frank Russell, (8) E. C. Orton, (9) A. D. Gudger, (10) Grahame-Davies, (11) F. Worswick, (12) Lambert Barton, (13) S. Cownie, (14) H. E. Duncan.

to England, and was for some months engaged in instructing recruits for the Flying Corps. A few months ago, while he was coaching an air pilot, his machine dived and the pilot was killed, but Lord Lucas escaped. Recently he went out to France for the life of greater activity which he preferred. He is 40 years of age, and unmarried.

Married and to be Married.

The marriage of Captain EDWARD NOEL CLIFTON, Coldstream Guards and R.F.C., only son of Mr. and Mrs. Clifton, of 12, Cambridge Square, to Miss NANCIE VERA NICOLSON, daughter of Mr. J. Nicolson, of Hampstead, took place on the 8th inst. at St. Paul's, Knightsbridge. Mr. T. D. Spenser, Coldstream Guards, was best man, and Captain W. L. Robinson, V.C., Lieutenant F. Sowrey, D.S.O., and Captain Holmes, all of the Royal Flying Corps, and Captain Finch, Rifle Brigade, acted as ushers.

The marriage of Mr. SYDNEY PICKLES, son of Mr. M. P. Pickles, of Australia, and Miss A. R. E. MARKS, daughter of Mr. Ritchie Marks, of Hampstead, N.W., took place quietly at St. James's, Piccadilly, W., on November 15th.

The marriage of Lieutenant ROCKINGHAM CONYERS GILL, R.G.A. and R.F.C., elder son of Mr. and Mrs. Rockingham Gill, of Singlerose, Cole Park, Twickenham, and the Manor of Treverbyn, Cornwall, and CHRISTINA DOLORES COURT TREATT, daughter of Mr. and Mrs. R. Court Treatt, of 6, Nevern Road, S.W., and the Mill House, Elstead, Surrey, will take place at St. Cuthbert's, Philbeach Gardens, on December 9th, at 12 o'clock. Friends will be welcome at the church.

A marriage has been arranged between Lieutenant H. D. WHITELAW WILSON, R.F.C., eldest son of Mr. and Mrs. J. Whitelaw Wilson, of Belgrano, Buenos Aires, and MARGERY, eldest daughter of Mr. and Mrs. CHAS. THOROWGOOD, "San Remo," Haywards Heath, Sussex.

Items.

Second Lieutenant F. W. GRIFFITHS, R.F.C., of Caxton Road, Wood Green, has been taken prisoner, and is now in East Prussia. For some time he was on the "missing" list. His parents have now received a letter from him.

THE ROLL OF HONOUR.

REPORTED by the Admiralty:—

Accidentally Killed.

Flight-Sub-Lieut. F. A. R. Malet, R.N.

Died of Injuries.

Flight-Sub-Lieut. W. S. Stewart, R.N.

Accidentally Injured.

Prob. Flight-Sub-Lieut. W. A. Curtis, R.N.

Officially reported a Prisoner of War.

Flight-Lieut. G. G. G. Hodge, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. F. P. Kane, R.F.C.
2nd Lieut. J. Turk, R.F.C.

Died of Wounds.

9882 1st Air-Mech. F. Dearing, R.F.C.
15699 2nd Air-Mech. V. Brazier, R.F.C.
34555 2nd Air-Mech. S. Du Mont, R.F.C.
17243 2nd Air-Mech. W. Wiltshire, R.F.C.

Wounded.

Capt. G. D. Hill, Hussars and R.F.C.
Lieut. C. N. Jones, Sherwood For., attd. R.F.C.
2nd Lieut. R. H. Wallace, Yeomanry and R.F.C.
2nd Lieut. C. E. Ward, R.F.C.
Lieut. G. H. Wood, R.F.C.
1491 Sergt. S. Cockerell, R.F.C.
5077 2nd Air-Mech. J. L. Mole, R.F.C.
10024 2nd Air-Mech. F. W. Kottle, R.F.C.
1110 Corpl. A. Rideout, R.F.C.
6527 Corpl. R. B. Bolton, R.F.C.
12105 1st Air-Mech. P. Daley, R.F.C.
7429 1st Air-Mech. C. Gall, R.F.C.
27882 2nd Air-Mech. J. H. Harrobin, R.F.C.
13719 2nd Air-Mech. W. Lamb, R.F.C.

Previously reported Missing, now reported Wounded and Prisoners of War in German hands.

2nd Lieut. F. H. Bowyer, Queen's, (R.W. Surrey), attd. R.F.C.
2nd Lieut. C. Elphinston, R.F.C.
2nd Lieut. F. A. A. Hewson, Border, attd. R.F.C.
Lieut. G. Klingenstein, R.F.C.
2nd Lieut. J. C. Taylor, K.O. Scottish Bord. and R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. J. W. Bowring, S. Lancs., attd. R.F.C.
Lieut. L. R. Briggs, London and R.F.C.
2nd Lieut. E. Burton, R.E. and R.F.C.
2nd Lieut. D. S. Cairns, Rifle Brig. and R.F.C.
2nd Lieut. W. R. C. Carmichael, Highland L.I. and R.F.C.
Lieut. A. T. Easom, R.F.C.
2nd Lieut. W. J. Gray, R.F.C.
2nd Lieut. F. W. Griffiths, Middlesex and R.F.C.
Lieut. H. F. Mase, R.F.C.
2nd Lieut. A. L. Pinkerton, R.F.A. and R.F.C.
2nd Lieut. F. D. H. Sams, R.F.C.
2nd Lieut. M. H. Strange, R. Fus. and R.F.C.
2nd Lieut. J. L. Tibbetts, R.F.C.
2nd Lieut. K. E. Tulloch, R.F.C.
2nd Lieut. B. M. Wainwright, R.F.C.
Capt. R. E. Wilson, Hampshire and R.F.C.
3389 Sergt. B. Irwin, R.F.C.
6537 1st Air-Mech. L. O. Law, R.F.C.

Prisoner of War in Turkish hands.

Capt C. L. Woolley, R.F.A., attd. R.F.C.

Missing.

Lieut. A. Anderson, Connaught Rangers, attd. R.F.C.
2nd Lieut. G. H. Bentham, E. Surrey, attd R.F.C.
2nd Lieut. L. C. L. Cook, A.S.C., attd. R.F.C.
Lieut. T. M. Johns, Welsh, attd. R.F.C.
2nd Lieut. W. E. Knowlden, Border, attd. R.F.C.
Capt. Lord Lucas, Yeomanry and R.F.C.
2nd Lieut. S. W. Mann, R.F.C.
2nd Lieut. H. L. Morgan, Border.
Lieut. G. H. Nicholson, R.F.C.
2nd Lieut. B. W. A. Ordish, R.F.C.
Capt. A. J. M. Pemberton, M.C., Leinster, attd. R.F.C.
Lieut. J. M. J. Spencer, Northumberland F. and R.F.C.
2nd Lieut. A. E. Wynn, R.F.C.
4043 1st Air-Mech. B. C. Digby, R.F.C.
649 Flight-Sergt. E. Haxton, R.F.C.
3023 Corpl. B. G. F. Jeffs, R.F.C.
3467 1st Air-Mech. H. A. Harding, R.F.C.

Previously reported believed Taken Prisoners at Kut-el-Amara, now reported Prisoners of War.

7373 2nd Cl. Air Mech. R. G. Nickolls, R.F.C.
7870 2nd Cl. Air Mech. S. J. Wells, R.F.C.

A One-Legged Pilot.

PAUL ALBERT PIERRE TARASCON, who has been mentioned in the French *communiqué* for bringing down his seventh German, has the distinction of having an artificial leg.

Carpentier Wins Another Award.

FOR his aerial work in connection with the taking of Fort Douaumont, Georges Carpentier, who has been mentioned three times in despatches, has been awarded the Medaille Militaire.

A Salonica Zeppelin Echo.

IT is reported from Salonica that it has recently transpired that two men belonging to the crew of the Zeppelin which was brought down in the outskirts of Salonica on May 5th managed, although wounded, to effect their escape from the marshes of the estuary of the Vardar, where the airship fell. They obtained refuge at the village of Kulakia, east of the Vardar, where they were succoured, and eventually got over the frontier into Bulgaria.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *Admiralty, November 10th.*

"An attack was carried out in the early hours of this morning on the harbour and submarine shelters at Ostend and Zeebrugge by a squadron of naval aeroplanes. A great weight of bombs was dropped with satisfactory results."

General Headquarters, November 10th, 9.49 p.m.

"As the result of the improvement in the weather there was great aerial activity yesterday and much useful work done. Many bombing raids were carried out on the enemy's communications, billets, and stores. Air fighting was almost continuous. One of our squadrons of 30 machines encountered a squadron of from 30 to 40 machines, and an aerial battle took place. The enemy's squadron was broken up and dispersed. Six of his machines were seen to commence to fall out of control, but owing to the severity of the fighting it was not possible to watch them to the ground. As a result of other fights nine more hostile machines were driven down in a damaged condition. Three of these are known to have been destroyed. A hostile kite balloon was also attacked and sent down in flames.

"Seven of our machines are missing."

Admiralty, November 11th.

"With reference to the attack on Ostend and Zeebrugge, carried out by a squadron of naval aeroplanes on the 10th inst., one of our machines—Flight-Lieutenant Geoffrey G. G. Hodge, R.N.—has failed to return. A Berlin official report states that he has been taken prisoner. All the other machines returned safely."

General Headquarters, November 11th, 9.57 p.m.

"Yesterday there was again considerable activity in the air. During the day bombing raids were continued with effect against enemy hutments, aerodromes, and headquarters, and at night the enemy's stations and trains were successfully attacked. Two trains were hit with bombs, while a third was set on fire, and a number of explosions followed. In the course of numerous air fights three enemy machines were destroyed, and a fourth was forced to land in our lines. Many others were driven down in a damaged condition. One of our machines is missing."

Admiralty, November 12th.

"On November 10th a squadron of naval aeroplanes, operating against the Bulgarian coast, successfully bombarded enemy aerodromes and stores at Drama, Porna and Angistra. Excellent results were achieved.

"The bombardment of the enemy's steel works at Volklingen by British aeroplanes referred to in the French *communiqué* of November 11th was carried out by a squadron of the Royal Naval Air Service."

War Office, November 12th.

"*Salonica.*—Enemy aerodromes at Drama and camps near Porna were successfully bombed by our naval aircraft.

Admiralty, November 13th.

"At noon yesterday (12th inst.) a squadron of naval aeroplanes carried out an attack on the harbour at Ostend. A considerable number of bombs were dropped on the Atelier de la Marine (naval workshops) and on war vessels in the harbour."

War Office, November 13th.

"*Egypt.*—The G.O.C.-in-C., Egypt, reports two successful air attacks on Maghdaba and Birsaba. At Maghdaba the enemy's camp and store sheds were bombed, and a number of direct hits caused much damage. At Birsaba a 100-lb. bomb hit the aerodrome; an Aviatik whilst being brought from the hangar was directly hit, the hangar also being damaged. Bombs were dropped on the railway station, sidings, and rolling stock, which suffered much damage. Two hostile Fokkers were driven down in a damaged condition. Bombs equivalent to a ton of high explosive were dropped during the two raids. All our machines have returned safely in spite of very heavy fire from anti-aircraft guns and attacks of enemy aircraft."

"*Mesopotamia.*—On November 7th two British aeroplanes bombarded, with good results, the headquarters of some Turkish irregulars near Al Ain, on the Euphrates, 45 miles west of Nasiriyeh."

"*Salonica.*—On the Doiran front our aircraft carried out reconnaissances, during which three enemy aeroplanes were forced to descend behind their lines."

French. *Paris, November 6th.*

"In telegrams of yesterday's date the Germans declare that they have shelled Rheims as reprisals for an alleged bombardment by the French of inhabited places behind the German front. At no time have the people who are French been subjected to a bombardment by French airmen, who strictly follow the instructions they receive and only drop bombs on military establishments, bivouacs, or enemy railway lines. The truth is that the Germans have fired at Rheims since October 26th, the day following their defeat at Verdun, and that out of revenge they continued the bombardment on October 27th, 28th and 29th, and November 4th, in proportion as their defeat was aggravated. That is the truth, and all other pretexts which they invoke to justify their barbarous acts are absolutely lies.

"German aircraft dropped several incendiary bombs on Nancy yesterday towards 10 p.m. There were no victims, and no damage was done."

Paris, November 7th.

"*Salonica.*—Our aeroplanes bombarded several localities in the valley of the Vardar. An enemy aeroplane was brought down near Monastir during a fight by one of our pilots."

Paris, November 8th.

"North-west of Pont-à-Mousson two enemy aeroplanes were brought down in air fights by our pilots. One fell near Vieville-en-Haye and the other in the direction of Vilcey-sur-Trey.

"On Monday night eight of our bombarding aeroplanes dropped over a ton of projectiles on the aerodrome of Frescaty, and a similar quantity on the military railway station of Chambley. The objectives were struck.

"*Salonica.*—Our aeroplanes bombarded the military camps in the region north of Monastir."

Paris, November 10th.

"There was great reciprocal aviation activity yesterday. Our aeroplanes engaged in 77 fights, in the course of which a Fokker biplane was brought down in our lines near Auberive, a Rumller was forced to descend near St. Hilaire-le-Grand (the two aviators are prisoners), another machine was certainly brought down, and seven came down in the German lines on the Somme.

"Our bombing squadrons dropped 700 bombs or shells on the communications and cantonments behind the front, especially on the railway stations of Lens and Vouzières, and 270 bombs on the blast furnaces of Algrange, near Thionville, the aerodrome of Dieuse, the railway station of Courcelles-sur-Nied, and the aircraft sheds of Frescaty."

"*Salonica.*—British aeroplanes bombarded the stations of Porna and Puljovo."

Paris, November 11th.

"During the day of November 10th three German machines were brought down by our pilots in the Somme region. Two of them were brought down by Lieutenant Guynemer, one south of Nesles and the other near Morcourt. This brings up to 21 the number of enemy machines destroyed up to date by this pilot. Two other German aeroplanes, attacked by ours, fell smashed to the ground, the first in the Champagne, north of Auberive, and the second in Lorraine, south of the Gremecey Forest, where it fell in flames. During the night of November 9th-10th our bombarding squadrons dropped 2,205 kilos. (4,860 lb.) of projectiles on the stations, bivouacs, and enemy parks on the Somme front. One of our aeroplanes flew over the Rhine between Neuf Brisach and Strassbourg, and dropped six bombs on the station of Offenburg, which suffered important damage.

"Between 10 and 11 o'clock in the morning of November 10th a group of 17 British aeroplanes bombarded the steel works of Foeklingen (north-west of Sarrbruck); 1,000 kilogrammes (2,204 lb.) of projectiles were dropped on the buildings, which suffered great damage. In the course of the operation the British aeroplanes fought several actions against enemy machines, of which three were felled.

"The following night, between 8 and 9 o'clock, eight of our aeroplanes carried out a fresh bombardment of these factories, in the course of which 1,600 kilogrammes of projectiles were dropped. Several fires were observed. All our machines returned safely.

"During the night of November 10th-11th our squadrons drenched with projectiles the stations of Ham, St. Quentin, Tergnier, Nesle (in the Somme region), the aerodrome of Dieuze, the blast furnaces of Romsbach, the aeroplane hangars of Frescaty, and the blast furnaces of Hagondange. These operations caused great damage to the enemy, and several explosions and fires were observed.

"German aeroplanes during the night of November 10th-11th bombarded several French towns. Nancy and Lunéville received projectiles which caused no damage and inflicted no casualties. The open town of Amiens was also bombarded on different occasions during the same night. Nine persons of the civilian population were killed and 27 were injured."

Paris, November 12th.

"Lieut. Herteux yesterday brought down his twelfth aeroplane. The German machine fell in flames to the west of Sailly Saillisel. It is confirmed that Lieut. Deulin on Friday brought down his ninth enemy machine to the east of Péronne.

"It is confirmed that Adjutant Bonnefoy brought down on November 4th his fifth German machine."

Paris, November 13th.

"Nine bombarding aeroplanes and seven escorting planes of the British Royal Naval Air Service bombarded the blast furnaces and foundries of Saint Ingbert, north-east of Sarrebruck, in the basin of the Sarre. All the machines returned. Two German machines last night dropped bombs on Belfort. Five civilians were wounded."

Russian. *Petrograd, November 3rd.*

"In the Caucasus on November 1st, two of our airmen bombarded the large Turkish encampments near Ishak-Majdany, north-west of Nurik, and near Tykolan, south-east of Cholik, and also two bridges on the Euphrates, near Sagan."

Petrograd, November 8th.

"In the wooded Carpathians, west of Tartarow, an aerial fight took place between one of our aeroplanes and an enemy machine. Our machine was brought down, and the airman, Sub-Lieutenant Lagutenko, perished. The condition of the observer, Non-Commissioned Officer Waitzman, is hopeless."

Italian. *Rome, October 31st.*

"As the result of an aerial fight on the Carso, an enemy aeroplane was brought down in our lines. One of the two aviators was dead; the other was taken prisoner.

"*Albania.*—On October 29th hostile aircraft made a raid over the region of Klisura and the Lower Vojussa, dropping bombs without doing any damage.

"*Salonica.*—One enemy aeroplane, while reconnoitring, was shot down near the railway station of Akindzali, on the line Doiran-Demir Hissar. A Bulgarian detachment went forward to recover the machine, but was dispersed by the fire from our artillery, which completely destroyed the aeroplane."

Rome, November 1st.

"Numerous air fights took place, in the course of which two enemy aeroplanes were driven down. Fourteen Caproni battle-planes, escorted by Nieuport chasers, bombarded with marked success the railway stations of Nabresina, Dottegliano, and Scoppo, on the Carso. Our aviators were fired on by anti-aircraft guns and attacked by enemy aeroplanes, but all returned safely to our lines. Enemy aircraft dropped bombs in the Cordevole Valley, in the Upper Vanoi Valley, near Tolmezzo, and on villages on the Lower Isonzo. A few people were wounded, but no material damage was done."

Rome, November 2nd.

"Hostile aircraft dropped bombs on several villages of the Lower Isonzo. The casualties at Pieris were one soldier and a captain and four men of the Red Cross. A powerful squadron of sixteen Caproni battle-planes escorted by Nieuport machines, bombed enemy camps in the Frigido (Vippach) Valley with two tons of explosives. In spite of heavy fire from hostile anti-aircraft batteries, all the machines returned in safety."

Rome, November 3rd.

"During a hostile air raid on the night of November 1st-2nd over the Lower Isonzo, our guns brought down hydroplane 'L.75.' The officer pilot was killed."

Rome, November 5th.

"On the evening of November 4th enemy aircraft dropped bombs on Monfalcone without doing damage. Our guns brought down one of the aeroplanes in flames."

Rome, November 8th

"Enemy aircraft dropped bombs on the usual localities on the Lower Isonzo, killing two people and wounding a few others.

"One of our seaplanes bombarded enemy works at Salvore point, at the entrance of Pirano Bay.

"Yesterday afternoon squadrons of Italian and French aircraft carried out an offensive reconnaissance on the enemy coast. Bombs were dropped with good results on the aviation station at Parenzo and on craft used for military purposes in the harbour of Cittanuova. In spite of the violent fire of the anti-aircraft defences and of a counter-attack by enemy seaplanes, all our machines returned safely.

"Enemy seaplanes dropped several bombs without any effect on some of our torpedo-boats, which also returned safely to their base."

Rome, November 9th.

"Enemy aircraft dropped bombs near Monfalcone, killing a man and wounding a few others."

Rome, November 13th.

"On the night of November 11th a squadron of enemy aeroplanes dropped bombs on Padua. A building where numerous women and children had taken refuge was destroyed, with the result that the greater part of them were killed. The number of dead ascertained already amounts to 60."

Roumanian. *Bucharest, November 8th.*

"Enemy seaplanes attacked Sulina. One machine was brought down and captured, with its pilot and observer."

Bucharest, November 9th.

"In the upper valley of the Aseu our troops brought down an aeroplane of the Hindenburg type. We captured the pilot and observer."

German. *Berlin, November 4th.*

"Nine enemy aeroplanes were shot down in aerial fights and by our defensive fire."

Berlin, November 7th.

"A German air squadron in a night bombing attack set on fire large ammunition depôts at Cerisy, south-west of Bray. Continuous and formidable detonations were felt as far as Quentin."

Berlin, November 8th.

"On Monday night a German air squadron attacked a French military camp in the valley of the Close, west of the Bois Ocessaire, and in the Bois Celestine, north of Cérisy, on the Somme. Good results were observed in the tents and barracks, where conflagrations broke out.

'On the same night another German squadron attacked the great ammunition station at Cérisy, where long goods trains were standing. This station, which is the centre of the French ammunition supply, and the surrounding ammunition depôts were set on fire. The flames spread to the whole of the big ammunition depôt, which was blown up by a series of explosions. The scene of the conflagration and the searchlight positions were attacked by our brave airmen with machine-guns, and great clouds of smoke were noticed over the place and were encountered by our airmen at a height of about 3,000 ft.

"Other German air squadrons on the same night bombed about 20 enemy poistions behind the enemy's front where Russian soldiers were billeted. Numerous conflagrations were observed. The railway works near Preyart, Amiens and Longueau were damaged by bombs. On the line Amiens–Pont de Metz a bomb weighing 112 lb. destroyed a moving train."

Berlin, November 10th.

"The activity of aviators, which had been very lively throughout the day, was continued in the clear moonlit night. During the course of numerous air engagements we brought down 17 enemy machines, most of them on both sides of the Somme. Our squadrons repeated their effective attacks on railway stations, troop encampments, and munition dumps, especially in the region between Péronne and Amiens.'

Berlin, November 11th.

"Clear autumn weather favoured the reciprocal artillery and aerial activity.

"Nine inhabitants of the occupied territory fell victims yesterday to the bomb attacks made by enemy aviators against villages behind our front. The military damage caused was slight. Ten enemy aeroplanes were brought down yesterday in aerial battles by our anti-aircraft guns."

Austrian. *Vienna, November 1st.*

"Italian airmen dropped numerous bombs on Duttouleo, Sesana, and Miramar, without causing noteworthy damage. Captain Schjenzel shot down a Caproni machine over Panzano Bay."

Vienna, November 3rd.

"Yesterday evening several of our seaplane squadrons attacked with good effect Cervignano, Ciorgo di Mogavo, Pioris, Grado, Adria, and works near Monfalcone. Numerous full hits were obtained on military objects and railway works at the above mentioned places and on a shed and aerodrome at Grado."

Vienna, November 4th.

"During the evening of the 3rd inst. a naval aeroplane squadron dropped numerous bombs upon military objects at San Canziano, Monfalcone, and the Adria Works."

Vienna, November 8th.

"Near Tartarow an Austro-Hungarian airman shot down a Russian Nieuport biplane.

"Yesterday afternoon enemy airmen bombed the towns of Rovigno, Parenzo, and Citta Nuova, without causing the least material damage. There were no casualties. Our airmen went up in pursuit, and shot down an enemy airman, who came down near some enemy torpedo-boats on the open sea. These were attacked with bombs by our airmen, and steamed off towards the enemy coast. The same evening an enemy airman unsuccessfully dropped bombs near Rimago. Our seaplanes successfully bombed military objects at Vermigliano, and returned safely."

Bulgarian. *Sofia, November 8th.*

"Enemy aviators displayed lively activity, but without effect, behind our front."

BRITISH AIR WORK.

The following was issued by the Air Board on October 30th :—

"October 1st. *Hostile aircraft.*—On the evening of September 30th one of our patrols encountered many hostile machines. A formation of seven Rolands near Bapaume was dispersed, two of them being driven down out of control.

"On October 1st, Capt. 'A' drove down two patrolling machines out of control near Gommecourt. He afterwards waited and attacked three hostile machines which came up from a neighbouring aerodrome; he forced one to land and dispersed the remainder.

"Lieut. 'B' and Lieut. 'C,' when taking photographs, were attacked by seven Rolands. The attack was driven off with the assistance of two of our patrolling machines, who joined the fight. One of the Rolands fell in a nose-dive, and was seen to plunge to earth.

"October 10th.—Lieut. 'D' and Lieut. 'E' had six encounters between 7 and 8.45 a.m. whilst on artillery patrol. In an encounter with three L.V.G.'s one German machine dived emitting clouds of smoke, having been engaged at 20 yards' range. The remaining machines declined close combat.

"Second Lieut. 'F,' in the course of an encounter with several hostile machines, had all the controls of his machine, with the exception of the rudder, shot away. His machine turned a somersault and was wrecked; the pilot was unhurt.

"*Bombing.*—A highly successful bombing raid was carried out against railway trains and stations at Queant, Cambrai and Bapaume at about 11 p.m. on the night of the 10th inst. A train entering Cambrai was attacked and wrecked, a bomb being observed to hit the first carriage behind the engine The second bomb hit the station buildings, whereupon all the lights were extinguished.

"Second Lieut. 'G' fired a drum of ammunition from 1,400 ft. at a closed touring car. The car immediately stopped, and three people got out of it and ran away."

THE MID-AIR BATTLE.

One of the most graphic pictures of the battle between 70 machines which took place on November 9th, is that by the *Times* correspondent at the British Headquarters. We reproduce this below, and further refer to it in a leaderette on page 992 :—

"The German airmen have grown bolder than for a long time past. Evidently they have largely increased the number of their machines upon this front, and stung, doubtless, by the contempt into which their flying services had fallen even in the eyes of their own troops, they are making a more serious attempt to dispute the mastery with us than they have made this summer.

"That the Germans will continue to struggle desperately to regain some measure of the air supremacy—and of the self-respect—which they have lost, we must presume. The winter will probably see very bitter fighting, if not often battles on so grand a scale as that on November 9th. But all air fighting is now much closer and more savage than it has ever been before. The importance of air mastery has been more clearly demonstrated and the individual fighting skill immensely increased. With the greater speed of machines and greater cleverness in handling, the old leisurely combats are no more, when two machines might fly side by side and empty successive drums of ammunition each at the other. It is now a headlong plunge and a single shot; a dip and a swerve and another shot; a loop and a glimpse, and a single shot again, a duel swifter, more breathless and more reckless than any fighting ever was on earth or sea.

"In their new effort the Germans are copying our tactics exactly; and by 'ours' I mean those of the French as well as ourselves; for the flying services of the two armies work in such perfect harmony that they are to all intents one single service. Some of the things which have given us our air supremacy are of British initiation and some French; but we practise and use them in common and share equally the glory.

"It is a long time since the German initiated anything new in the air. Now, in his recrudescence of activity, he is doing his best to learn from us. He copies exactly our methods, formations, and air tactics. In the recent moonlight nights especially, his airmen have been penetrating behind our lines, trying to bomb railheads and transport, and so forth; and individual Germans are even getting so bold as to do what we have done for the last four months, namely, fly low enough to use their machine guns on troops in trenches or on columns on the road. So far they are making little by it; and they are having a most exciting time.

"One of the chief evidences of the new activity has been the great aerial battle, wherein some 70 aeroplanes were engaged, which the official *communiqué* has already mentioned. It took place between 9 and 10 o'clock on the morning of November 9th, well over the German lines in the direction of Vaulx-Vraucourt, north-east of Bapaume, whither certain of our aeroplanes were bound on a bombing expedition. With them were fighting machines and scouts, making in all a fleet of 30 sail. Near the villa of Mory, just before reaching Vaulx-Vraucourt, they sighted an enemy squadron somewhat outnumbering themselves, the actual strength being something from 36 to 40 aeroplanes.

"We attacked at once. Some of our machines were flying at a higher level than the enemy, and they plunged headlong to join in the general engagement, which was fought at an average height of not much above 5,000 ft. Of the *mêlée* which followed it is impossible to get any coherent account, for no man in it had time or thought for anything except the enemy machines with which he was successively engaged; but for 20 minutes there raged among the clouds such a battle as the world has never seen before: an inextricable tangle of single combats, of darting, swirling machines, the air filled with the roar of 70 propellers and the chatter of guns.

"Four of our machines were lost, that is to say, that they were compelled to descend in German territory, a strong westerly wind drifting the battle as it raged more and more over enemy's soil. In the ships which came home, one brought a dead observer, and two others, with wounded pilots, had difficulty in beating up against the wind and landing in our lines.

"Of the enemy we know that six machines were sent to earth, of which three are known to have crashed. What happened to the other three, beyond that they were falling out of control, is not known. In yet another the pilot was seen to be shot dead. What further casualties the enemy suffered he only is aware; but the best evidence that the victory was ours lies in the fact that the whole enemy formation was broken and scattered. The Germans fled for safety in all directions, leaving us in possession of the sky. Then we went on upon our business, we punctually dropped our bombs on the stores and ammunition depôts of Vaulx-Vraucourt, and then came home proudly flying in regular formation, no German daring to interfere.

"It is, of course, one drawback to the splendid audacity with which we carry the fighting always into the enemy's country that we cannot count his dead. We know only how many of our own machines do not come home, and how many of the enemy's machines have visibly crumpled and fallen, obviously wrecked or in flames. In such a fight as this—in every fight where more than a single aeroplane is engaged on either side—a victorious combatant cannot stop to watch the adversary who goes to earth to see if he is really broken. Another opponent demands his instant attention; and of those birds which are winged and crippled but can just limp home, or of those others which carry their shot for a while and then fall dead, we learn nothing. And it is curious how large a part in this is played by the westerly wind which blows here for three-quarters of the year. Even when an east wind does blow here, it is seldom flying weather; so practically every battle is fought in a wind against which no disabled machine of ours can beat home, while the enemy has always his own soil below him and a wind in his favour.

"Taking this same day as an example, the official *communiqué* has told you that in all seven of our machines were missing, including the four in this great battle. Of German machines we know that we 'drove down' 15, including the six of this battle, 'in a damaged condition'; but how many others crawled home nursing wounds, or how many withdrew from the fighting in good order and then fell later, we have no way of telling. What we do know is that, continuing to run vastly greater risks than his men have yet learned to run, we daily inflict on the enemy heavier losses, counting those which are obvious alone, than we suffer."

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"MÜNCHAUSEN MÄRCHEN" UP TO DATE.

Although the tales told by returning Zeppelin commanders of their supposed doings have not been lacking in lurid details, apparently the German public desires more, and so the well-known Berlin firm of Ullstein and Co., the owners of the *Vossische Zeitung*, the *Berliner Zeitung am Mittag*, and other periodicals, have published a book entitled "Zeppelins over England," which they have copiously illustrated with horrific pictures of blazing and devastated English towns, factories, harbours and ships. "This book," says a correspondent of the *Daily Chronicle* who has reviewed it at considerable length, "apparently collects all the awful tales of calamity in all their absurdity, with which the German public have been regaled for the past 12 months. These we need not repeat. But there are new features as well, newer and spicier details of terrible destruction served up, from which a few extracts may be given. We note the glee with which the author does his work, the gloating over horrors, his howls of fiendish joy. Doubtless he knows his public.

"The author supposes himself in a Zeppelin, which has already reached the English coast, and has been appointed to operate between Yarmouth and Norwich. The Great Central Railway unites these two towns. The trains on this line travel relatively slowly, but on this night their pace was accelerated. It was 'flight, flight!' But above in the air there was something moving still more rapidly. Bursting bombs hailed on the railway stations, destroying, tearing. The metals rolled up like thin wire. A searchlight is turned on the Zeppelin, a bomb extinguishes it, and batteries which had fired in the light of the searchlight were silenced for ever.

"'The Destruction goes its way along the line, which is torn up beyond recognition. A train approaches at racing speed. With thunderous crashing, which is heard above the droning of the air-screws, the locomotive pitches into the ruins, turns over, the train burns. British troops will not be transported on that line for some time to come. The German Death swings his scythe, and prepares himself for new blows. This is war—war which *you would* have. The starved, ruined Germany approaches you!'

"In Lincolnshire, proceeds our liar, railway stations, great stores, barracks were attended to. Bombs struck a remount depôt. Many hundreds of horses were killed, torn to pieces. 'There must be no pity for these horses. It is another blow for the British front. Do the British tacticians require horses to storm the trenches? One less trouble for our comrades on the Somme.'

"Another Zeppelin is approaching the Coast. 'Forward, yonder is England!' There is a ship below. Its three slender smokestacks are visible. On this ship fell the first iron greeting. Badly injured, the stricken ship runs to the coast and is stranded. 'One ship less.' At the end of Spurn Head the lighthouse flames out. Crash down on it went a bomb, and the proud edifice toppled over and fell with loud tumult across the mole. 'One mark less to steer by!' 'And the loss is all the more keenly felt because of the difficulty of navigating the river up to Hull. The English Admiralty, of course, denies everything, as usual. Lighthouse? Nothing of the kind. That was a lame mule and a young, innocent child that the bomb fell on.'

"Much savage gloating is gloated over Grimsby, which is alleged to have suffered terribly. 'Here in Grimsby are the most dangerous enemies of our U-boats—the fishermen, mine-sweepers, and the patrol boatmen, who sniff out the submarines.' Great execution was done among oil-tanks, on which incendiary bombs were dropped. We get the words of command which the commanders of the Zeppelins call out to their crews:—

"'Incendiary bombs!'

"'Quick fire!'

"And then columns of dense smoke and forked flame shoot up to the heavens. Munition factories burst in a million fragments. Their value is millions of pounds. 'Incendiary bombs! And in eight or ten places fire—a monstrous fire, lurid in the night. The place is bright as day. Panic! There underneath they are running wildly about, seeking to save themselves, seeking shelter. Close by is the railway station. One train after another streams out of the station, and a congested mass of people storms the building seeking flight. Hundreds, thousands!'

"'Looking at the dense masses tightly squeezed together a horrible recollection dawns on the Zeppelin commander. The Zeppelin hovers over the station. Not very long ago in Carlsruhe there was a joyful festal multitude in the streets. The enemy bombs crashed down on innocent people, shattering, tearing, killing. Hundreds of children wallowed in their blood. Remember Carlsruhe! No, we are Germans, we are Huns, barbarians! We do not fight against children, and the commandant left the word of command unspoken!'

"After their night of terror, in which the entire Eastern Coast had burst into flames, the order was given 'Homewards!' A fiery monster sprang up to the sky almost licking the clouds. It was their last bomb. 'The air seems to rotate, a current seizes the Zeppelin, shakes the gondolas, beats on the hull. The gigantic torch of fire is our signpost, and illuminates the great grey Zeppelin, which soars ever higher and higher, unapproachable as it stands out to sea."

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French "Ace" Pilots.

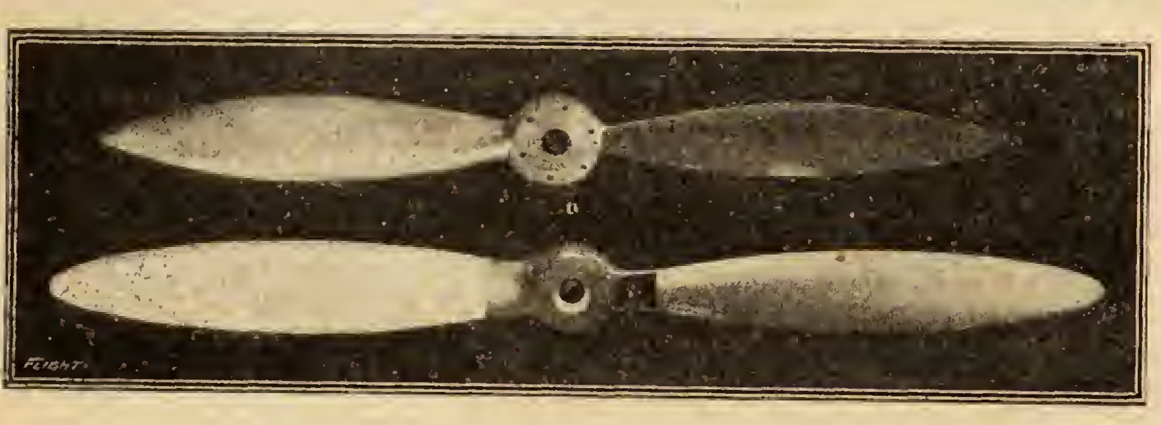
Up to the present 20 French pilots have attained to "ace" rank by bringing down five enemy machines and thereby becoming entitled to have their name mentioned for each further machine they destroy.

The American Escadrille.

Further information regarding the escadrille of American aviators who, as recorded in last week's Flight, are now stationed in the Somme, are given by Mr. Henry Wood, the United Press correspondent with the French Army. Their machines bear as a distinctive badge a Red Indian head. There are over 100 American volunteers in the French flying service, but the majority are under training. So far the casualties are three men killed—Chapman, Rockwell and Prince—and two wounded—Lieut. Thaw, who is again flying, and Bolsley, of Texas, who is injured for life.

A REVERSIBLE TYPE OF PROPELLER.

Although the theory of propeller design is not yet thoroughly understood, such theories as exist being in many cases contradictory, the general trend may be said to be towards an application of the theory first advanced by Drzewiecki in 1882, and which was to the effect that each element of the screw blade may be considered separately and as behaving in the same manner as if moving through the fluid in a straight line. Applied to the air screw this means, of course, that the elements along the blades are treated as aerofoils, and that sections which have been found to give good results in large size as wings of an aeroplane will, generally speaking, be found to give good results on a reduced scale when forming the elements of an air screw. The general characteristics of lift coefficients, drift coefficients and lift/drift ratios are applicable to the elements of the screw—modified, of course, to suit constructional considerations.

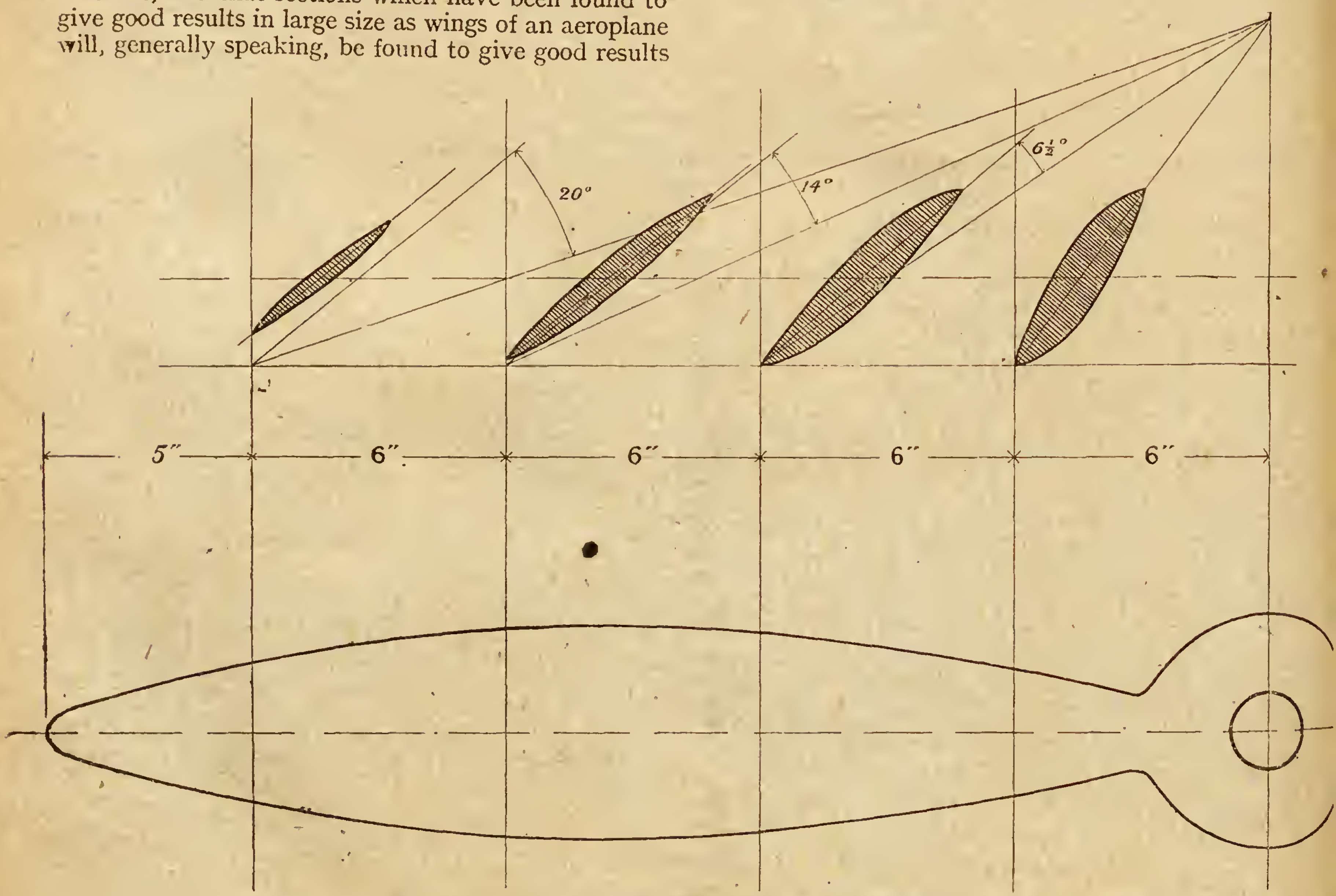


Two of Mr. Austin's reversible propellers.

For a considerable time now Mr. A. Austin, of Kempston, Bedford, has been experimenting with air-screws of various shapes, all having one characteristic in common, however much they differ in details—*i.e.*, they are reversible. In the accompanying illustrations are shown two of these propellers, one of which has a radially expanding pitch in which the chord lines of the various elements are sensibly parallel at all radii. In the other propeller, it will be seen, a more orthodox method has been followed, in that the helix angles diminish in the manner usual in a propeller of uniform pitch, while the angles of attack do not vary greatly from root to tip.

What is most interesting about these propellers, however, is the fact that they are reversible, and that therefore the sections at various radii from the centre of the propeller boss are totally different from those generally used in air screws.

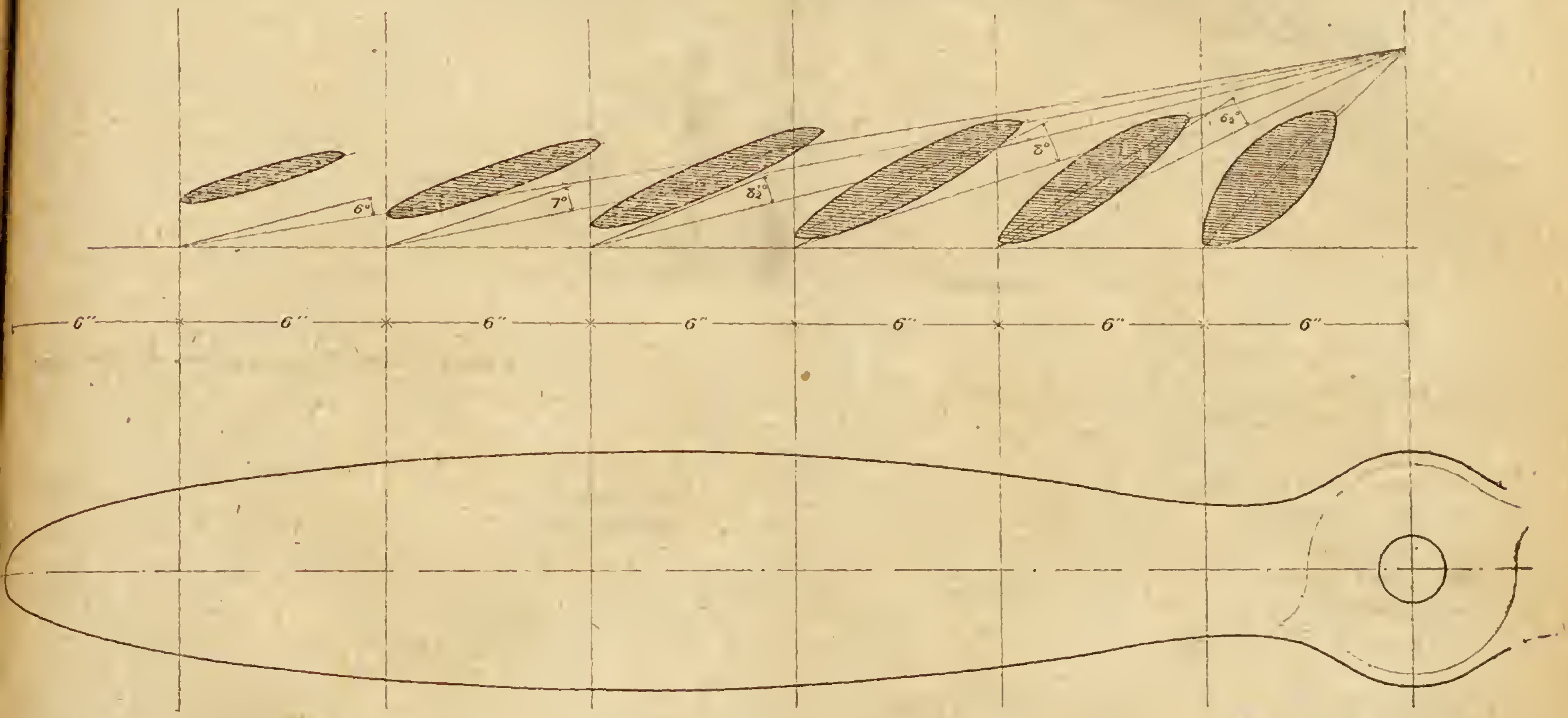
The peculiarity may, perhaps, be best explained by saying that the blades consist of the upper surfaces of an ordinary propeller turned round end to end and with their flat under surfaces together. It is, of course, not to be understood that this simile refers to the construction, which is of the usual laminated type, but merely to the sections. These latter, by the way, are not to be taken as absolutely correct, as Mr.



Reversible propeller with radially expanding pitch.

Austin did not supply us with drawings, and so, in order to get a clear idea of the principle of the propellers, it was necessary to find the angles and sections by placing the propellers on a table, the angles being measured and the projected blade widths found, while the sections were obtained by making templates in plasticine at various radii from the boss.

With regard to the sections the drawings show with sufficient accuracy the general peculiarities, which are that for the top camber the maximum ordinate is situated from about half-way to quarter of the chord from the leading edge, while in the lower surface the position is reversed, the maximum ordinate being situated from one-half to one-quarter of the chord from the *trailing edge.* Whether this section would be very efficient considered as an aerofoil is impossible to say until results of model tests are available, but a fair idea may, perhaps, be formed by comparing them with *Aile* No. 56 tested at the Eiffel Laboratory. This section, which was tested for the Deperdussin firm, shows very similar characteristics, except that it has a considerably higher fineness ratio. The Deperdussin section has, according to Eiffel's tests, a maximum lift coefficient of 0·36 (Absolute) at an angle of incidence of 15°, while at the more usual angle for a propeller blade, *i.e.*, about 6°, the lift coefficient is 0·16. These values are not very high compared with other aerofoil sections, and it would be interesting to see whether the section would prove more efficient on a screw. The lift/drag ratio of the Deperdussin section mentioned above is about 7·7 at an angle of incidence of 6°, which is not very encouraging.



Another form of reversible propeller, in which the pitch may be said to be uniform, but the angles of attack vary.

* * *

SIDE-WINDS.

Mr. Fred Norman, late of the Scottish Aviation Co., Glasgow, who was the first man to fly a Scottish-built aeroplane—the Caledonia monoplane in 1911—is now, under the name of the National Aircraft Manufacturing Co., Printing House Yard, 15a, Hackney Road, N.E., busily engaged in turning out woodwork for aeroplanes, spars, struts, ribs, &c.

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Furniture makers are evidently a very enterprising community. This has been apparent from the way in which many of them have given up making dining-room suites in favour of building aeroplanes. Looking in at the fifty-sixth concert of the Furniture and Allied Trades Society at the King's Hall, Holborn Restaurant, on the evening of the Lord Mayor's Show, it seemed that aeroplane building must be an "Allied trade." Many familiar faces were to be seen, including Mr. S. J. Waring, of Waring and Gillow, Ltd., who made a most popular Chairman. The concert was in aid of the Furnishing Benevolent Association, to which Mr. Waring has been such a good friend apart from the £1,000 which he gave by way of a start. The Association is doing splendid work not only at the home at Radlett, but also in assisting those who are fallen on evil days, and up to the last concert the musical society has contributed £288 8*s.* 7*d.* to help on the excellent work.

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The concert was a splendid one, and the audience most enthusiastic, which will be understood when it is mentioned that Mr. A. H. Botwright was the musical director. Songs were contributed by Miss Olive Sturgess, Miss Winnie Melville, Miss Winifred Dunk, Mr. Frederick Lake, Mr. Edward Dykes, Mr. Bromley Carter, Mr. Roland Merry; while Miss Dorrie Courtney played banjo solos, and little Miss Fifi Hallam recited. Two unexpected turns were Coram the ventriloquist and his orderly, and Mr. Ernest Hastings, who, by the kindness of Mr. Chas. Gulliver, of the Palladium, were able to spend a few minutes at the concert, and their efforts were greatly appreciated.

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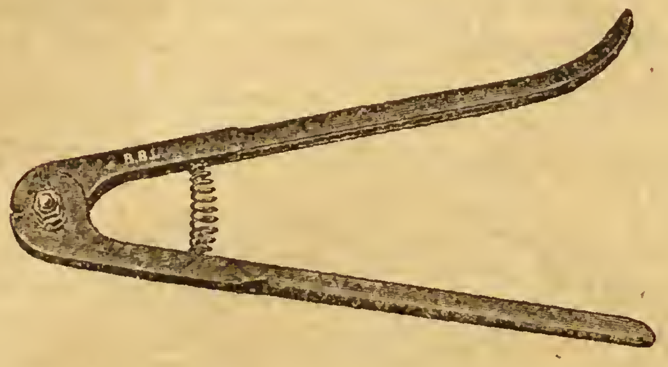
Although, of course, the oxy-acetylene welding process of repairing cracks and fractures of cylinders, crankshafts, aluminium castings of all descriptions, &c., is well known to most people, there are many who are not aware that the process can be utilised in other ways. Thus, Imperial Light, Ltd., of 123, Victoria Street, S.W., apart from the great increase in this department of their repair works, also report a good deal of activity in building up worn gears, which are afterwards machined and case-hardened so that they are returned to the owner equal to new in every respect. The constructional department of the works is also engaged extensively on the welding up of aeroplane parts. From their wide experience during the past eight years, the firm are in a position, in most cases, to quote a close price before putting the work in hand.

HAVING had many applications for a really strong wire cutter for aircraft work, Messrs. Brown Brothers, of Great Eastern Street, E.C., who are ever on the look-out for good things for their aircraft department, have taken up the sale of the tool illustrated below. These nippers will cut wires or steel rod up to $\frac{3}{16}$ in. diam. The action is not a shearing one, as in the usual form of nipper, but the cutters operate *à la* guillotine, leaving the severed ends clean and square. The cutting surfaces are easily replaceable at a very small cost, whilst the tool being sold at a moderate price it is a good investment, as it should give practically unlimited wear, besides performing its work much more satisfactorily than the old arrangement.



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THE merits of Triplex glass are so clear that practically all thoughtful aviators and motorists insist on its use wherever possible. Another splendid testimonial is just to hand from Leeds, where a car was in a bad smash, and the only bit of glass not Triplex—the front of a clock—cut the leg of a lady passenger pretty badly. The owner is now having Triplex fitted to that, and in a letter to the insurance company he says they should insist on Triplex being fitted to all cars or charge extra premium to those that haven't it,

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USERS of "Shell I" Motor Spirit have another opportunity of making a little sacrifice for the benefit of the nation, and doubtless no grumbles will be forthcoming, as they will be helping on the good work of the Air Services. Consequent upon the great and growing demands of our air fleet, together with the submarine flotillas, which practically absorb the supplies of Shell I, the proprietors announce that this grade is temporarily withdrawn from sale for pleasure motoring. By way of compensation, increased supplies of Shell II and Crown spirit have been arranged for, so that users will have no difficulty in getting their full supply, even although their favourite grade will be denied them for the present. In cases where petrol gas lighting and other plants have been installed on the understanding of an unfailing supply of the highest grade "Shell," it will still be possible to arrange for the necessary amount.

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NEW COMPANIES REGISTERED.

"NIEUPORT" AND GENERAL AIRCRAFT CO., LTD.—Capital £200,000, in £1 shares. First directors: Sir Inigo Thomas, G.C.B., Geo. C. de Wilde, Henri Kapferer, Gustau de Lage and F. Lane.

SMITH'S STATIC MOTOR, LTD., Caxton House, Westminster, S.W.—Capital £100, in 2s. shares. Aeroplane engine and motor manufacturers, &c., acquiring interests in patents, &c., relating to aeroplane motors or engines. First directors: H. Heenan, T. H. Duffell, A. Smith, C. Schofield and Major Taylor.

STANDARD VALVES, LTD.—Capital £5,000, in £1 shares. Acquiring business of manufacturers of and dealers in valves for aeroplanes, motor cars, &c., carried on at Standard Works, Balmoral Road, Northampton, as the "Valve Syndicate." First directors: D. Barratt and D. H. Gainsford.

S.Y.S. ENGINEERING CO., LTD., LEEDS.—Capital £1,200, in £1 shares (600 6 per cent. cumulative preference), manufacturers of component parts of machinery, aircraft and munitions of war. First directors: A. Yewdall, A. Smith and Major Sheldon.

TRACTION DEVELOPMENT, LTD., Hampden House, Kingsway, W.C.—Capital £30,000, in £1 shares (10,000 7½ per cent. preferred ordinary), manufacturers of locomotives, traction engines, motor cars, aeroplanes and all heavier-than-air flying machines, and fittings for the same, &c.; under agreement with R. F. Macfie and Macfie and Co., Ltd. First directors: F. Macfie and H. F. Smalman-Smith.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

STRAIGHTS with instructor last week: Lieut. Flynn. Circuits with instructor: Messrs. Balden, Child, Green, Kent, Lord and Robertson. Circuits alone: Messrs. Cockell, Kaizer, Munro, Payne, Sutherland, Travers. Meering, Whiteman, Woods and Zambournis.

Brevets during week: Messrs. Culver, Hitchcock, Norris, Ranson, Rogers and Steeves.

Instructors: Messrs. Manton, Winter, Pashley, Hale and Biard.

Bournemouth School.

PUPILS with instructor last week: Mr. Ross. Rolling alone: Messrs. Hall, Pete and Fisher. Straights alone: Messrs. Allen and Ross. Half circuits alone: Messrs. Holland and Burry. Circuits and eights alone: Mr. Davies.

Instructors: Messrs. E. Brynildsen and H. Smith.

35, 45 and 60 h.p. Caudron biplanes in use.

Certificate was taken by Mr. Davies.

There will be a few vacancies in the school during the week.

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PUBLICATION RECEIVED.

Aircraft of To-day. By Charles G. Turner. London: Seeley, Service and Co., Ltd., 38, Great Russell Street. Price 5*s*.

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IMPORTS AND EXPORTS, 1915-1916.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; for 1914, see "FLIGHT" for January 15th, 1915; and for 1915, see "FLIGHT" for January 13th, 1916:—

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February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	59,287	2,400	—
July ...	1,240	2,072	13,372	12,932	—	—
August ...	664	2,583	36,276	13,555	247	420
September	536	1,076	4,908	36,048	—	—
October ...	1,344	952	17,702	9,289	—	8
	32,662	28,379	120,295	225,848	48,791	4,518

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THE PUBLISHERS.

EDITORIAL COMMENT.

ARISING out of our comments under this heading in our issue of last week, we have received letters from correspondents which, while we cannot publish them, for reasons which are good and sufficient, bearing in mind the times in which we live, raise certain questions which certainly bear some amount of discussion.

"Prepare for 1917."

One letter which lies before us emphasises the point that the almost hysterical comments made by the daily Press on the work of our airmen at the Front, make it not unlikely that the necessity for progress in design may be lost to sight. That was exactly what we had in mind when we wrote as we did a week ago. It is an unfortunate fact that we, as a nation, are far too prone to take things for granted, and to assume that because they are as they are to-day, they will of necessity remain so to-morrow. It is this national characteristic upon which successive administrations have traded, with the result that every crisis, big or small, in which the Empire has found itself involved has discovered us in a state of absolute unpreparedness to meet it. So far, we have never gone to the extreme of hanging anybody for our unpreparedness. Invariably the excuse has been that the nation itself was equally to blame with those who are paid to guide its policy, and that if only the nation had forced the hands of the Government of the day, all would have been well. And the excuse always goes down, and we go on happily in a state of semi-somnolence until the next crisis arises.

The worst of it is that the powers that be too often have a great deal of justice on their side when they advance the excuses we have outlined, since those who stand for public opinion in the Press are generally at considerable pains to assure the nation that all is exactly as it should be. For proof of this we have only to regard for a moment the despatches of some of the correspondents which impelled us to take the line we did. If we accept them at their face value, we must believe that our aerial supremacy on the Western Front is a fact unchallengeable and unalterable. Witness the remark we quoted from one despatch last week, to the effect that in aviation "the Bosche has ceased to exist." That argues that, so far as the air is concerned, there is no more need for us to worry. We have driven the enemy from the air beyond all hope of his recovery of his lost position. It means that or nothing at all, particularly as the correspondent fails entirely to make it clear that to maintain what we have gained means even more strenuous effort than has been expended in the past to achieve to our present supremacy. Pessimism may be the deadly sin now, but we are not sure that it is not run to a short head, if the expression may be permitted in this case, by the sort of optimism indulged in by newspaper correspondents of the type whose rosy accounts of aerial war in France we are deprecating. They create an entirely false atmosphere by the implication—which is not good for either the public or the official mind—that all is so well that it can never be ill. We have only too good reason to know that nothing is done unless there is more or less force of public opinion at work to lessen official inertia. If the public, therefore, is continuously assured that there is no need for it to express any opinion save that all is well, it almost necessarily follows that the Government will continue along the line of least resistance.

It is quite natural that those who really know what is necessary to maintain our present paramountcy in the air should feel some disquietude in view of the irresponsible chatterings to which we directed attention. That disquietude is apparent in some of the letters we have received bearing on the subject. We cannot say that we do not to some extent share the feeling of anxiety. Paradoxically, perhaps, our anxiety is the outcome of knowledge of the tremendous efforts that have been exerted to place our air service in the position it occupies of being superior at all points to that of the enemy. In this way. We have had to build and equip an enormous number of machines, and, moreover, we have been and are now compelled to lay plans for future construction and equipment very far in advance. That in its turn means a very large degree of standardisation, and standardisation means, unless we are very careful indeed, stagnation of design. There is no getting away from it—there are a dozen illustrations to hand to prove the proposition. And anything in the way of stagnation of that kind is the very last thing to be tolerated now. We are fully prepared to admit—we believe it to be the case—that those responsible for the proper equipment of the air service are alive to the need for progress, but the danger is an insidious one, and therefore needs to be insisted upon.

Unfortunately, it is impossible to be explicit in the illustration of our meaning, for very obvious reasons. But it is possible to generalise in order to make the main points clear. We have now a very large number of machines actually in commission and in course of delivery. Many of these machines are of a type that was excellent a few months ago and superior to any contemporary German type. But construction is an ever-progressing factor as the lessons of war are learnt and appreciated, and it thus follows, as day follows night, that the machine that was *facile princeps* yesterday is obsolescent to-day. It is unfortunately the case that construction cannot keep pace with improvement in design, and thus we are compelled to a policy of compromise. It is here lies the danger of the situation, and the more it is persisted that all is well the greater is the danger.

It is during the coming winter that we shall have to prepare for the spring and summer of 1917. That preparation does not only connote the building of a greater number of machines than the enemy can turn out, but they must be of types certainly not inferior to the best he can put into the air. If our scheme of construction provides for numbers of machines of obsolescent type, then it must be rigorously revised with a view to replacing them with a better. Undoubtedly there are in use a very large number of machines that have been well described as "good, but not quite good enough." It may mean scrapping these already in commission and cancelling contracts for identical types not yet delivered. To do that would mean financial loss, but whatever that loss, it would be cheap at the price. What we have got to aim at is that when the good flying weather comes in the early spring our air service shall be as definitely on top of the Germans as it has been during the autumn of this year. It can be done if the right policy is followed now, and, in our view, that policy must be to cut losses, however they arise. If it is a question of compensation to contractors for work partially completed, then let the compensation be forthcoming. If it is a question of ruthlessly scrapping a hundred or even a thousand "good" machines, then let them be scrapped in favour of better, Incidentally, it need not necessarily mean the *actual* scrapping of large numbers of machines, since those of the "good" types can be used for other purposes than actual "strafing" operations. But no more of them must be built. If that is the policy we are going to pursue, then there is no need to fear the result of the 1917 struggle for command of the air. If, on the contrary, the policy is to be one of following the line of least resistance, the result is much more doubtful.

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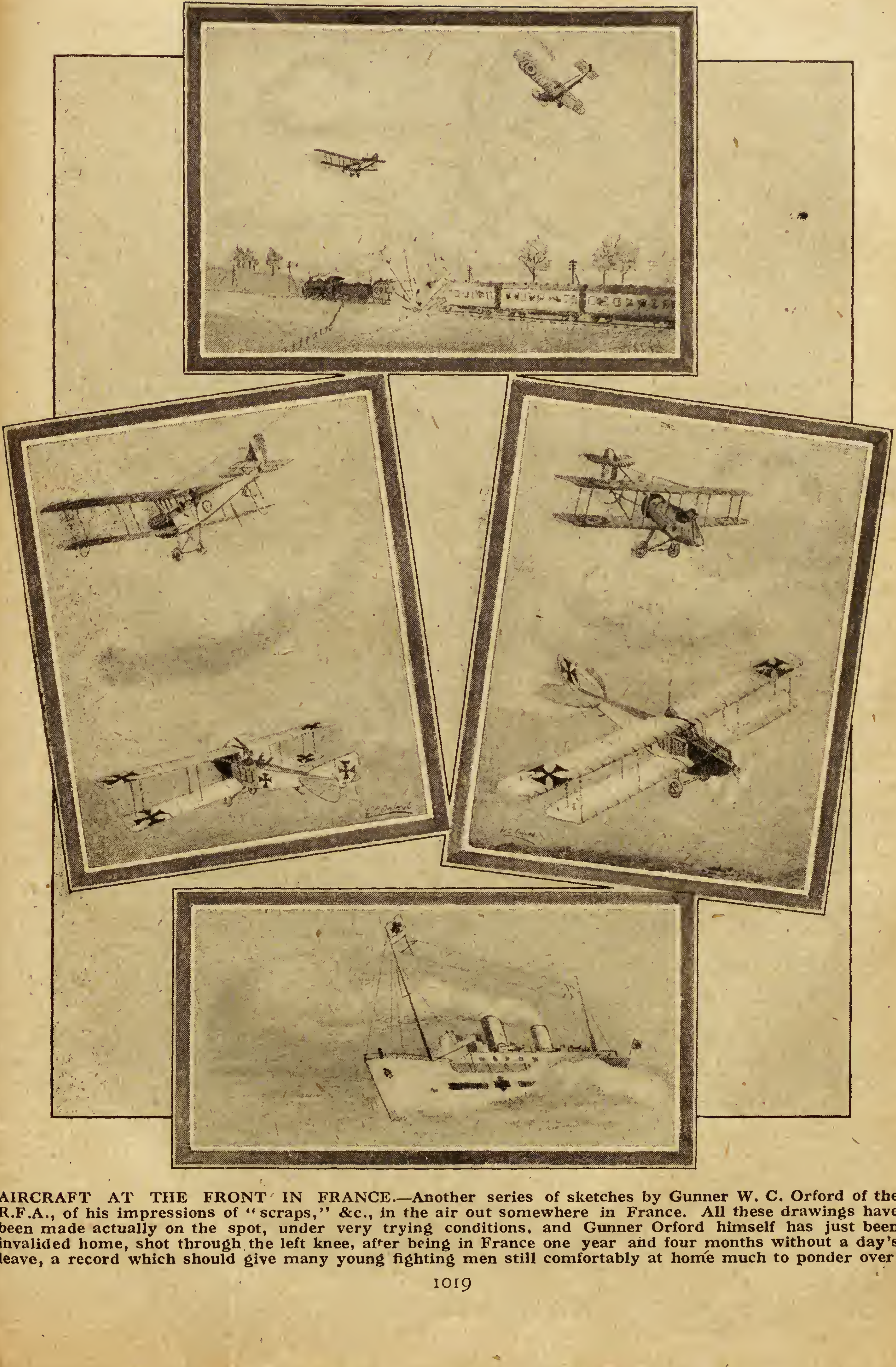
What about the Air Board? Seven weeks ago the Air Board report was circulated to the Cabinet. Since then there has been almost endless discussion of the Air Board and its organisation, both in the Press and arising out of questions in Parliament, but apparently nothing has resulted. At least, nothing has transpired publicly to give rise to the impression that the report and all connected with it has not followed so many other reports of the kind into the limbo of official pigeonholes. The question of the best manner of co-ordinating the needs of the two branches of the Air Service is so directly related to preparation for next year's campaign, that it would be impossible to refer to the one without touching upon the other.

There is nothing to be added to what we have written on other occasions on this pressing subject. Therefore, we do not intend to do more at the moment than reiterate the question: What about the Air Board? Is anything going to be done or not? Is the Cabinet afraid to tackle the subject for some reasons that are not fully apparent, but which have been hinted at? The matter is a serious one, and



AIRCRAFT AT THE FRONT IN FRANCE.—Another series of sketches by Gunner W. C. Orford of the R.F.A., of his impressions of "scraps," &c., in the air out somewhere in France. All these drawings have been made actually on the spot, under very trying conditions, and Gunner Orford himself has just been invalided home, shot through the left knee, after being in France one year and four months without a day's leave, a record which should give many young fighting men still comfortably at home much to ponder over.

demands an answer without delay. Whether the Parliamentary Air Committee will succeed in getting a satisfactory statement of the position when the resolution standing in its name comes to be debated in the House of Commons remains to be seen. But if the answer is not forthcoming then, we are gravely mistaken if the country does not insist on more information than is available at present. These are not times when there should be any hesitancy in clearing King Log out of the way.

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A Shock for the Mohmands. There is a lot behind the bald official announcement, contained in a *communiqué* of the Secretary of State for India, relating to a recent frontier fight with Mohmands, to the effect that: "For the first time in Indian warfare aeroplanes were used, and afforded great assistance." We have become so used to the aeroplane in war that it comes almost as a shock to read that it has been used "for the first time" in any warlike operations. Doubtless, the great assistance of which the *communiqué* speaks lay as much in the moral effect produced by the strange birds of Eblis on the Mohmand *morale* as in the information they were able to bring in. One thing that does strike us, though, is that the aviation service of the Indian Army must have been a long way behind if it is only now that aeroplanes have come into use in frontier fighting. We have had no really big affairs up there for some years now, but the border is never at peace, and scarcely six months can pass without it being necessary to undertake military operations of some sort. It is in little "shows" of the sort that the aeroplane ought to have proved itself invaluable. However, better late than never. It would be interesting to have the Mohmand comments on this new departure in war. They would probably avail us very little, for the opinions of the frontier tribesmen on the devices of the Feringhi are generally quite unprintable, even when they can be translated.

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THE ROLL OF HONOUR.

Reported by the War Office:—

Killed.

2nd Lieut. C. H. Bidmead, Shrop. L.I. and R.F.C.
2nd Lieut. C. J. Creery, R.F.C.
2nd Lieut. E. S. P. Hynes, Buffs (E. Kent) and R.F.C.
2nd Lieut. W. Jordan, R.F.C.
2nd Lieut. H. G. P. Lowe, R.F.C.
2nd Lieut. C. E. MacRae, Seaforth Hdrs., attd. R.F.C.
5710 1st Air Mech. H. T. J. Thake, R.F.C.
10023 2nd Air Mech. J. Banks, R.F.C.

Previously reported Missing, now reported Killed.

2nd Lieut. W. D. Miller, R.G.A. and R.F.C.
2nd Lieut. H. J. Newton, Ches., attd. R.F.C.
Capt. J. L. Whitty, M.C., Leinster, and R.F.C.

Previously Unofficially, now Officially, reported Killed.

2nd Lieut. C. Monckton, R. Irish Fus., attd. R.F.C.

Died of Wounds.

2nd Lieut. J. Allan, R.F.C.
2nd Lieut. A. A. Paterson, Border, attd. R.F.C.

Previously reported Missing, now reported Died as a Prisoner of War in German hands.

Lieut. J. A. N. Ormsby, Mach. Gun Brig., attd. R.F.C.

Died.

20012 2nd Air Mech. R. F. Reynolds, F.R.C.

Wounded.

Capt. W. T. L. Allcock, R.F.C.
Lieut. A. D. Bell-Irving, Gordon Hdrs., attd. R.F.C.
2nd Lieut. N. Brearley, M.C., King's (Liverpool), attd. R.F.C.
2nd Lieut. J. D. Cowie, Argyll and Suth. Hdrs. and R.F.C.
Lieut. G. E. Goolden, A.S.C. and R.F.C.
2nd Lieut. T. Hayes, R.F.C.
Capt. G. H. Norman, R.F.C.
2nd Lieut. H. C. Short, R.F.C.
2924 Flight Sergt. J. Helingoe, R.F.C.
9557 2nd Air Mech. W. Horsley, R.F.C.

Missing.

2nd Lieut. M. Allport, R.F.C.
Lieut. T. M. Bennet, M.C., R. Irish Rifles, attd. R.F.C.
Capt. A. C. Bolton, M.C., R. Scots Fus., attd. R.F.C.
2nd Lieut. J. G. Cameron, Cameron Hdrs., attd. R.F.C.
2nd Lieut. I. Curlewis, R.F.C.
2nd Lieut. H. F. Evans, R.H.A. and R.F.C.
2nd Lieut. H. A. Hallam, York and Lancaster, attd. R.F.C.
Lieut. G. F. Knight, Devonshire, attd. R.F.C.
Capt. T. Mapplebeck, King's (Liverpool), attd. R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. M. S. Faraday, R.F.A. and R.F.C.
Lieut. J. W. Sanders, Middlesex, attd. R.F.C.

Correction: **Wounded.**

2nd Lieut. W. C. Crawford, Mach. Gun Corps and R.F.C., should read: 2nd Lieut. K. Crawford.

Air Work in Mesopotamia.

A despatch from Sir Percy Lake dealing with the operations in Mesopotamia from the fall of Kut up to August, when he relinquished the command to General Maude, was published last week. In the course of the despatch Sir Percy Lake says:

"As regards aviation, the superiority of certain of the hostile aeroplanes over any of our machines in the matter of speed, combined with a large reduction in the number of our pilots (due to sickness partly attributable to overwork), enabled the enemy in May and June to establish what was very nearly a mastery of the air.

"With the arrival of more pilots from home matters improved, until in August three of our machines, working together, forced the best enemy machine, a Fokker, to descend, seriously damaged, in its own lines.

Air Work on Indian Frontiers.

The following was issued by the Secretary of State for India on November 18th:—

"On 14th inst. the Government of India reported that large Mohmand forces, estimated at 6,000, were collecting on the border opposite Shubkadr. Our troops engaged them on the 16th. The enemy were too scattered to offer a good target for guns. For the first time in Indian warfare aeroplanes were used, and afforded great assistance. The enemy losses are reported to be about 100 killed or severely wounded. Our casualties were one man killed and ten wounded. The Mohmand forces have apparently withdrawn, for a reconnaissance on the next day only located a very small party."

A Government Aeroplane Factory in Canada.

According to messages from Ottawa, it is officially announced that a Dominion Government aeroplane factory is to be established in Canada, probably in Toronto, at a cost of approximately $1,000,000. It will be equipped to turn out six machines weekly, and they will be purchased by the British Government. This arrangement is said to be the result of an inquiry conducted by members of the Imperial Munitions Board which found that large orders for aeroplanes had been placed in the United States. Representations were made therefore to the Ministry of Munitions to the effect that the industry, with proper organisation, might be built up in Canada.

The British Air Services

"PER ARDUA AD ASTRA"

Under *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, November 15th.

E. G. Walker granted temp. commission as Lieut., R.N.V.R., with seniority Nov. 14th.

Admiralty, November 18th.

Temp. Lieut.-Com., R.N.V.R., G. Holmes promoted to temp. com., with seniority Nov. 16th.

Admiralty, November 20th.

P. M. Davson granted a temp. commission as Sub-Lieut., R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to date Nov. 18th.

H. D. Dall, C. E. Skinner, and W. O. Spinks entered as warrant officers, second grade, for temp. service and appointed to the "President," additional, for R.N.A.S., to date Nov. 18th.

The undermentioned have been entered as prob. flight officers for temp. service, to date as stated :—F. D. J. Silwood, Nov. 26th ; H. Nixon, Nov. 19th ; and G. F. F. Read, Nov 26th.

Royal Flying Corps (Military Wing).

London Gazette Supplement, November 13th.

Balloon Officers.—Oct. 26th : 2nd Lieut. (Temp. Lieut.) K. M. Cattley, R. Suss. R. (T.F.) ; Lieut. A. Knight, N. Lan. R., from Machine Gun Corps, and to remain secd. ; 2nd Lieut. (on prob.) C. Booth, E. Surr. R., and to be transfd. to Gen. List ; Temp. 2nd Lieut. G. K. Cathles, Gen. List ; 2nd Lieut. C. Deards, S.R. ; 2nd Lieut. H. Y. C. Clarke, S. Wales Bord., and to be secd. ; 2nd Lieut. (Temp. Lieut.) C. M. Down, Herts. R. (T.F.) ; 2nd Lieut. J. B. Mendham, R.W. Fus. (T.F.) ; Temp. 2nd Lieut. J. S. Giffard, Manch. R., and to be transfd. to Gen. List ; Temp. 2nd Lieut. H. F. Fuller, D. of Corn. L.I., and to be transfd. to Gen. List ; Temp. 2nd Lieut. H. F. Darby, E. Surr. R., and to be transfd. to Gen. List ; Temp. 2nd Lieut. W. A. J. Gribble, Gen. List.

London Gazette, November 14th.

Flying Officers.—Oct. 22nd, 1916 : 2nd Lieut. (Temp. Lieut.) H. W. Hepburn, Manch. R. (T.F.) ; Temp. 2nd Lieut. (on prob.) H. E. Rahtkens, Gen. List. Oct. 25th : Lieut. G. W. Devenish, R.A., from a Flying Officer (Obr.) with seniority from July 1st ; 2nd Lieut. (Temp. Lieut.) P. J. Long, A.S.C., and to be seconded ; Temp. 2nd Lieut. J. W. Shaw, Oxf. and Bucks. L.I., and to be transferred to Gen. List. ; 2nd Lieut. C. C. White, S.R. ; Oct. 26th. Oct. 27th : Temp. Lieut. H. W. Woollett, Linc. R., and to be transferred to Gen. List. ; Temp. 2nd Lieut. T. H. Elliott, R.A., and to be transferred to Gen. List. ; Temp. 2nd Lieut. (on prob.) G. F. Tuberville, Gen. List ; Lieut. J. D. Belgrave, Oxf. and Bucks. L.I., and to be seconded ; 2nd Lieut. A. F. Quinlan, R. W. Kent R., and to be seconded ; Temp. 2nd Lieut. A. S. Keep, R. War. R., and to be transferred to Gen. List.

Equipment Officers, 3rd Class.—Oct. 30th : 2nd Lieut. (Temp. Capt.) J. C. Briggs, Leic. R. (T.F.) ; Temp. 2nd Lieut. (on prob.) J. S. Berdoe, Gen. List ; 2nd Lieut. (on prob.) G. Dennison, S.R. ; 2nd Lieut. (on prob.) H. L. U. Clark, S.R. ; 2nd Lieut. (on prob.) G. Urquhart, S.R. Temp. 2nd Lieut. (on prob.) H. Dear, Gen. List ; Oct. 31st. 2nd Lieut. E. E. Cutts, S.R. ; Nov. 2nd.

Memoranda.—The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C. : Sergt. J. H. Thorpe ; Sept. 12th. 2nd Class Air Mech. W. H. Scanlan, from R.N.A.S. ; Sept. 26th.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) E. D. Doring resigns his commission. Nov. 15th : The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank : C. C. White, E. S. Halford, C. Curwen, C. C. Bracebridge, R. W. Davies, E. Holloway, A. Hingston.

London Gazette Supplement, November 15th.

Flight Commanders.—From Flying Officers : Temp. Lieut. A. W. Keen, Gen. List, and to be Temp. Capt. whilst so employed ; Oct. 22nd. Capt. T. Mapplebeck, L'pool. R., S.R. ; Nov. 1st. Lieut. A. D. Bell-Irving, M.C., Gordon Highrs., S.R., and to be Temp. Capt. whilst so employed; Nov. 3rd.

Flying Officers.—Temp. 2nd Lieut. J. W. L. Birkbeck, Durh. L.I., and to be transferred to Gen. List ; Oct. 20th. Oct. 26th : 2nd Lieut. C. G. Brodie, Lond. R. (T.F.) ; 2nd Lieut. C. T. L. Donaldson, Queen's Own Glasgow Yeo. (T.F.) ; 2nd Lieut. T. R. C. Birkin, 7th D.G., and to be seconded ; Temp. 2nd Lieut. (on prob.) J. FitzHugh, Gen. List. Oct. 27th : Temp. 2nd Lieut. J. P. Morkam, Northn. R. ; Temp. 2nd Lieut. (on prob.) R. K. Jenkins, Gen. List ; 2nd Lieut. (on prob.) M. Johnstone, S.R. ; Capt. W. Ashton, Worc. R., S.R., and to be seconded ; 2nd Lieut. L. G. D'Arcy, Conn. Rang., S.R., and to be seconded. 2nd Lieut. J. E. Edgar, S.R. ; Oct. 28th. Oct. 29th : 2nd Lieut. F. O. Baxter, Ind. Army Res. of Off. ; 2nd Lieut. (on prob.) W. H. Cox, R. Fus., S.R., and to be seconded ; 2nd Lieut. (Temp. Lieut.) O. E. Ridewood, S. Wales Mtd. Brig., A.S.C. (T.F.) ; 2nd Lieut. D. E. P. Chaplin, R.A., and to be seconded. Oct. 31st : 2nd Lieut. (Temp. Lieut.) C. E. M. Pickthorn, A.S.C., S.R., from a Flying Officer (Obr.), with seniority from June 25th ; 2nd Lieut. H. G. M. Horne, Lond. R. (T.F.) ; Temp. 2nd Lieut. (on prob.) J. E. Blake, R.E. ; Temp. 2nd Lieut. F. Bissicks, Gen. List.

Equipment Officers, 2nd Class.—From Equipment Officers, 3rd Class : Nov. 1st : Lieut. E. W. J. Payne, S.R. ; 2nd Lieut. O. H. Frost, Middx. R. (T.F.), and to be Temp. Lieut. whilst so employed ; 2nd Lieut. B. F. Crane, S.R., and to be Temp. Lieut. whilst so employed. Lieut. V. F. P. Bryce, S.R. ; Nov. 4th.

Memoranda.—Cadet D. G. Robinson to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C. ; Sept. 10th. Jeejeebhoy Pinoshaw Bomanjee Jeejeebhoy to be Temp. Hon. 2nd Lieut. on Gen. List. for duty with R.F.C. ; Nov. 6th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank : J. E. Edgar, N. L. Knight. The undermentioned to be 2nd Lieuts. (on prob.) : P. R. Aitken ; Oct. 27th. W. G. Duffield ; Oct. 28th.

London Gazette Supplement, November 16th.

Flight Commanders (from Flying Officers, and to be Temp. Capts. whilst so employed).—Lieut. T. J. Mallory, Lan. Fus., S.R. ; Nov. 2nd. Temp. 2nd Lieut. W. L. Clark, Gen. List ; Nov. 3rd.

Equipment Officers, 3rd Class.—Oct. 1st : Lieut. (Temp. Capt.) G. F. Lucas, York. R. (T.F.) ; Temp. 2nd Lieut. W. J. King, Gen. List. 2nd Lieuts., S.R.—C. C. Bracebridge, C. Curwen, R. W. Davies, A. Hingston, E. Holloway, E. S. Halford.

Supplementary to Regular Corps.—2nd Lieut. E. F. Allen relinquishes his commission ; Nov. 17th.

London Gazette, November 17th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank : M. Johnstone, C. S. O'Grady, A. C. Kiddie, G. T. Pettigrew, J. H. B. Foss, G. D. Harrison. The undermentioned to be 2nd Lieuts. (on prob.) : Alfred Burgess ; Oct. 24th. F. W. Elstub ; Nov. 2nd. C. C. Holleray ; Nov. 6th.

London Gazette Supplement, November 18th.

The undermentioned to be Temp. 2nd Lieuts. (on prob.) :—

For duty with R.F.C.—Oct. 15th : Co. Sergt.-Maj. Instr. G. B. Neale, from Lond. R. (T.F.) ; Corpl. C. J. Strother, from R.F.C. ; Corpl. C. H. Parker, from R.F.C. ; Pte. F. P. Lambert, from Lond. R. (T.F.). Oct. 16th : Staff-Sergt. T. J. Legate, from Can. Infy. Brig. ; Sergt. F. G. Brockman, from Lond. R. (T.F.) ; 1st Class Air Mech. C. J. Pell, from R.F.C. ; Pte. T. B. Jones, from Can. Corps, Cav. Regt. Oct. 17th : Mech. Staff. Sergt. R. Cameron, from A.S.C. ; Pte. L. L. Brown, from Can. Divnl. Supply Co. ; Staff-Sergt. N. Liddall, from A.S.C. Oct. 20th : Corpl. J. G. Plester, from R.F.C. Oct. 21st : Corpl. A. M. Turnbull, from R.E. ; Oct. 22nd. Oct. 23rd : Acting Sqdrn. Sergt. Maj. W. R. P. Allen, from Northn. Yeo. (T.F.) ; Sergt. L. G. Fauvel, from

York Dns. (T.F.); Lce.-Corpl. H. C. Reade, from Shrop. L.I.; 2nd Class Air Mech. A. H. Steele, from R.F.C.

Flying Officers.—2nd Lieut. F. G. Russell, R.F.A., S.R., from a Flying Officer (Obr.), with seniority from March 24th, 1916; Oct. 30th. Oct. 31st: Lieut. (Temp. Capt.) S. Hooper, R.F.A. (T.F.); 2nd Lieut. W. J. Potts, R.F.A. (T.F.); 2nd Lieut. G. T. Pettrigrew, S.R.; 2nd Lieut. C. S. O'Grady, S.R.; 2nd Lieut. A. C. Kiddie, S.R.; Temp. 2nd Lieut. P. C. E. Johnson, Gen. List.

London Gazette Supplement, November 20th.

Flying Officers.—Temp. 2nd Lieut. P. H. Davy, Yorks. L.I., and to be transferred to Gen. List; Nov. 1st. Nov. 2nd: Capt. C. W. Rowe, Hunts. Cyclist Bn. (T.F.); 2nd Lieut., on prob.) J. D. V. Holmes, S.R.; Temp. 2nd Lieut. M. A. Kay, Gen. List. 2nd Lieut. (Temp. Lieut.) C. W. Short, M.C., Ind Army Res. of Off.; Nov. 3rd, but with seniority from May 30th.

Equipment Officers, 3rd Class.—Oct. 31st: Temp. 2nd Lieut. (on prob.) R. E. Wakelin, Essex R., and to be transferred to Gen. List; Temp. 2nd Lieut. (on prob.) H. S. Wilkins, Gen. List; 2nd Lieuts., S.R.—R. M. Ward, D. A. Pearson, A. W. Barlow; 2nd Lieuts. (on prob.), S.R.—J. Page, T. M. Wilson, R. G. Watts, G. Barfoot-Saunt, J. Farquharson, A. E. Blackmore, S. F. Feast, G. T. Bridgewater. Temp. 2nd Lieut. S. Mills, Gen. List; Nov. 3rd.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: A. W. Barlow, D. A. Pearson, R. M. Ward.

HONOURS FOR THE R.F.C.

In the *London Gazette* of November 14th it was announced that His Majesty the King has been graciously pleased to approve of the appointments of the following officers to be Companions of the Distinguished Service Order, in recognition of their gallantry and devotion to duty in the field:—

2nd Lt. Patrick Anthony Langan-Byrne, R.A. and R.F.C.

He has shown great pluck in attacking hostile machines, often against large odds. He has accounted for several. On one occasion, with two other machines, he attacked 17 enemy machines, shot down one in flames, and forced another to land.

2nd Lt. Claude Alward Ridley, M.C., R. Fus. and R.F.C.

For judgment in the execution of a special mission. When his machine was wrecked he showed great resource, and obtained valuable information.

It was further announced that the King has been pleased to confer the Military Cross on the following officers in recognition of their gallantry and devotion to duty in the field:—

Flight Commander Ball, Sherwood Foresters and R.F.C., who was on Saturday invested by the King at Buckingham Palace, with the D.S.O. and two bars (the first man with this honour) and the Military Cross. Capt. Ball is at the wheel of an Oldsmobile.

2nd Lt. Eric Noel Douglas Barr, R.A., S.R., and R.F.C.

For conspicuous gallantry and skill in an encounter with an enemy machine. By skilful manœuvring 2nd Lt. Barr and Lt. Lander drove the enemy machines behind the enemy's lines in a damaged condition.

Capt. Charles Hubert Boulby Blount, R.W. Surr. R. and R.F.C.

He has organised the contact patrol work of a new squadron, and has carried out valuable work in the air himself. On one occasion he flew for a long time at about 500 ft. under heavy fire to locate a battalion which was lost.

2nd Lt. A. V. Burbury, York. R. and R.F.C.

For conspicuous skill and gallantry. When observing from a balloon at a height of 3,000 ft., the cable was cut by a shell. He destroyed his papers, ripped the balloon—a most difficult operation in the air—and then got down in his parachute.

2nd Lt. Patrick Colin Campbell, Argyll and Sutherland Highlanders, S.R., and R.F.C.

For conspicuous skill and gallantry on many occasions. On one occasion, seeing a cavalry patrol held up, he came down to 600 ft., dropped bombs on the enemy and enabled his observer to enfilade the hostile trench with machine-gun fire. Finally, his engine was put out of action by rifle fire from the ground.

Temp. Capt. Reginald Chadwyck, R.F.C.

He dived down to a low altitude, attacking a train, displaying great courage and determination.

Lt. Sydney Herbert Clarke, Wilts. R., S.R., and R.F.C.

He has done fine photographic work, often working far over the lines and being heavily attacked by superior numbers of enemy machines. On one occasion, with another officer, he brought down one of five enemy machines which had attacked him.

2nd Lt. Ivan Curlewis, R.F.C.

He attacked an enemy machine, which he drove off. Later, he destroyed an enemy machine, and brought down a balloon under very heavy fire, displaying great courage and determination throughout.

Temp. Lt. William George Sellar Curphey, Gen. List and R.F.C.

He brought down an enemy machine, and two days later attacked and brought down another. He has frequently attacked formations of hostile aircraft and driven them down.

2nd Lt. Chester Stairs Duffus, R.F.C., S.R.

For conspicuous skill and gallantry in fights with hostile aircraft. On one occasion, after hard fighting, he brought down a hostile machine in flames on our side of the line.

Temp. Lt. (Temp. Capt.) Ernest Leslie Foot, Gen. List and R.F.C.

For conspicuous skill and gallantry. When flying a single-seater scout he dived on to five hostile machines, which were flying at about 2,500 ft., and drove one to the ground as a wreck. On many other occasions he has shown great determination when fighting enemy machines.

Lt. Robert Parsons Harvey, 5th Lrs. and R.F.C.

He attacked four hostile machines with great courage and skill, his observer shooting one of them down. He has on many previous occasions done very fine work.

Temp. 2nd Lt. Roderic Maxwell Hill, North'd. Fus. and R.F.C.

For conspicuous skill and gallantry. Under very heavy fire he dived at an enemy balloon and brought it down in flames. On the day before he had dived at a balloon under heavy fire at a low altitude, but had just missed his mark.

2nd Lt. Charles Stanley Hollinghurst, R.F.C., S.R.

For conspicuous skill and gallantry on contact patrol work. On one occasion he was attacked first by four and then by three enemy machines, but drove them all off and continued his patrol. On another occasion his observer was hit, and his machine badly damaged by anti-aircraft fire, but he came back for another machine, and went out again. Two days later he was wounded by flying over the lines at 1,000 ft.

2nd Lt. Robert James Hudson, R. Fus., S.R., and R.F.C.

He carried out artillery reconnaissances with great courage and determination. Later, on three occasions, diving to a low altitude, he engaged parties of infantry with his machine gun.

2nd Lt. Ralph Hensworth Jarvis, R.F.C., S.R.

While observing, he engaged and drove off three enemy machines, after which he returned and completed his work. Later, he carried out a valuable reconnaissance during a very strong gale. He has on many previous occasions done fine work.

2nd Lt. Leonard Cameron Kidd, R.F.C., S.R.

For conspicuous skill and gallantry on contact patrol work. On one occasion he carried out three contact patrol flights, each 1,000 ft., and obtained valuable information under heavy fire. He also attacked enemy reinforcements with a machine gun from a height of 500 ft.

2nd Lt. Arthur Gerald Knight, R.F.C., S.R.

He has shown great pluck in fights with enemy machines, and has accounted for several. On one occasion, when a hostile machine was interfering with a reconnaissance, he attacked at very close range, and brought down the enemy machine in flames.

Lt. Thomas Eaton Lander, High. L.I. and R.F.C.

For conspicuous gallantry and skill in an encounter with an enemy machine. By skilful manœuvring, Lt. Lander and 2nd Lt. Barr drove the enemy machine behind the enemy's lines in a damaged condition.

2nd Lt. Cecil Arthur Lewis, R.F.C., S.R.

For conspicuous skill and gallantry. He has done fine work in photography, with artillery and on contact patrols. On one occasion he came down very low and attacked a column of horsed limbers, causing casualties and scattering the limbers.

Temp. 2nd Lt. Frederick Libby, Gen. List and R.F.C.

As observer, he, with his pilot, attacked four hostile machines and shot one down. He has previously shot down four enemy machines.

Temp. 2nd Lt. Francis Steele Moller, Gen. List and R.F.C.

During a raid he dived 1,500 ft., and dropped his bombs on an ammunition train. He then chased three other trains, and attacked them with great courage and skill.

2nd Lt. (Temp. Capt.) Roger Henry Gartside Neville, D. of Corn. L.I. and R.F.C.

He is a fine leader of patrol work, and has done much to keep enemy machines away from our lines. On one occasion, flying in a rain-storm, after nearly colliding with an enemy machine, he pursued it and brought it down half a mile from an enemy aerodrome.

2nd Lt. George Philippi, Dns., S.R., and R.F.C.

He dived at a hostile balloon under heavy fire, and brought it down in flames. Though wounded in the head, he brought his machine back at a low altitude, and landed safely in his aerodrome.

2nd Lt. (Temp. Lt.) Geoffrey Ward Roberts, R.F., S.R. and R.F.C.

For conspicuous skill and gallantry when attacking hostile machines. On one occasion, when on offensive patrol, he brought down two machines.

2nd Lt. Hugh Anselm Boulton Robb, R.F.C., S.R.

He has done fine artillery work in all weathers. On one occasion, while flying a new type of machine, his engine failed, but he glided back over the lines under heavy fire, and landed his machine without damage on ground pitted with shell holes.

2nd Lt. Arthur John Graham Styran, R.A. and R.F.C.

He has done fine work with artillery for a long time, often in bad weather and under heavy fire. On one occasion he directed the fire of nine batteries on the enemy's trenches, and obtained a large number of direct hits.

Lt. (Temp. Capt.) John Hugh Samuel Tyssen, N. Som. Yeo. and R.F.C.

For conspicuous skill and gallantry. He has done fine work in photography, often fighting against odds in order to get his work done. On one occasion, when five enemy machines interfered with our patrol, he, with another officer, dived at one and brought it down.

Capt. Adolph Andre Walser, Lond. R. and R.F.C.

He carried out a most valuable artillery reconnaissance under very heavy fire, displaying great courage and determination. He has on many previous occasions done fine work.

Temp. 2nd Lt. John Scott Williams, Gen. List and R.F.C.

For conspicuous skill and gallantry when attacking enemy machines. On one occasion, with another officer as pilot, he brought down two enemy machines.

Temp. 2nd Lt. Geoffrey Hunter Wood, Gen. List, attd. R.F.C.

He has continually done contact patrol work, obtaining most valuable information, and displaying great courage and determination throughout.

2nd Lt. Charles Henry Chapman Woollven, Devon. R. and R.F.C.

He dived down to a low altitude, attacked a train, causing many casualties, and displayed great courage and determination throughout.

2nd Lt. (Temp. Capt.) Charles Service Workman, Sco. Rif. and R.F.C.

He and his pilot dived down to a low altitude, attacked a train, causing many casualties, and displayed great courage and determination.

The following has been awarded a 2nd Bar to his Military Cross for a subsequent act of conspicuous gallantry :—

2nd Lt. (Temp. Capt.) Sidney Edward Cowan, M.C., R.F.C., S.R.

He fought a long contest with seven enemy machines, finally bringing one down in flames. He has displayed great skill and gallantry throughout. (M.C. awarded in *Gazette* dated May 31st, 1916. The 1st Bar awarded in *Gazette* dated October 20th, 1916.)

The following has been awarded a Bar to his Military Cross for subsequent acts of conspicuous gallantry :—

2nd Lt. (Temp. Lt.) Malcolm Glassford Begg, M.C., Rif. Bde., S.R., and R.F.C.

He has on many occasions carried out successful contact patrol work at low altitudes, rendering most valuable reports and displaying great courage and determination. (M.C. awarded in *Gazette* dated September 22nd, 1916.)

In the list of awards of the Distinguished Conduct Medal for acts of gallantry and devotion to duty in the field appeared the following :—

1396 Sergt. T. Mottershead, R.F.C.

* * *

Fatal Accidents.

At Montrose on November 16th an aeroplane piloted by Lieut. Fowler, Royal Flying Corps, collided with the chimney of a house and remained fast on the roof. The impact caused the petrol tank to catch fire, and before assistance could be rendered the pilot was dead, though whether death was due to burning or to the collision is not known.

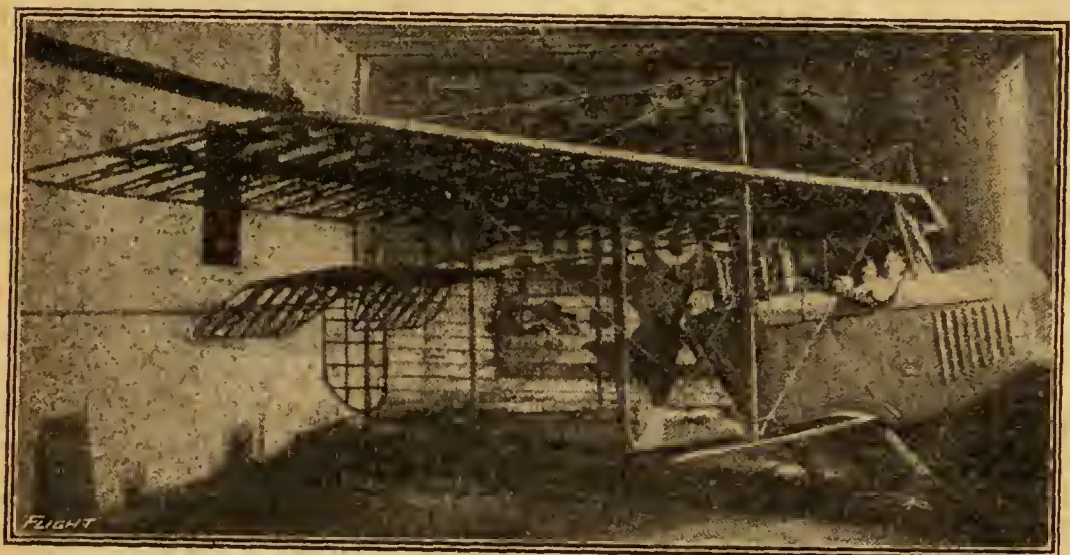
A verdict of "Accidental Death" was returned at an inquest on November 16th at Boldre in the case of Lieut. H. E. Byers. The evidence showed that the machine made a vertical dive from a height of 3,500 ft., and it was surmised that the deceased was seized with illness while in the air, as apparently the machine was in good order and nothing was seen to break while it was being flown.

THE BURANELLI-CARISI "PUSHER" BIPLANE.

Seeing that America has not done very much in the way of "pusher" biplanes of the headless *nacelle* type, and inasmuch as the gun 'bus is claiming no small amount of attention from designers at the present moment, special interest attaches to the machine, recently designed in America, illustrated in the accompanying scale drawings. This machine has been jointly designed by Mr. Vincent J. Buranelli and Mr. John Carisi, and was built some little time back in New York.

Although the Buranelli-Carisi, or "A.B.C." biplane, as it is named for the sake of brevity, might be said to belong to the Henry Farman type of biplane, it really differs from it in some of the essential features, *i.e.*, the main planes are swept back, the top plane has a considerable overhang, and only one pair of interplane struts on either side of the *nacelle* separate top and bottom planes. There are, of course, other less radical differences in minor details.

The top plane has a span of 40 ft. and a chord of 5 ft. 6 ins., whilst the lower plane has a span of 22 ft. and a chord of 4 ft. 6 ins., and both are swept back 10°. The trailing edges of both top and bottom planes are in line, thus giving the effect of staggering the planes. The planes are divided into five sections, two lower and three upper. The lower plane sections are mounted direct on to the *nacelle*, whilst the two innermost sections of the upper plane are anchored to two inverted V pylons of spruce struts mounted on the *nacelle*. All the mountings of these different sections are of the hinged quick detachable type, facilitating transport. The upper plane extensions measure some 12 ft. each, being braced by Roebling cable of 4,000 lb. tensile strain from pylons mounted on the extremities of the inner plane-sections above the interplane struts. A rather unusual feature for a machine of this type is that lateral balance is maintained by warping the top-plane extensions instead of employing *ailerons*.



The 100 h.p. Buranelli-Carisi pusher biplane in course of construction.

The planes are built up on solid I section spars with built-up ribs of similar section. The front spar of the upper plane is situated close to the leading edge, and the rear spar some distance from the trailing edge, whilst in the lower plane the front spar, which like the rear spar is of substantial width, forms the leading edge itself. Both top and bottom planes are wire braced between the spars, and Irish linen doped with Emaillite is used for the covering. The interplane struts, of spruce, are exceptionally strong and well streamlined. A wing-section giving high speed and maximum lift is employed.

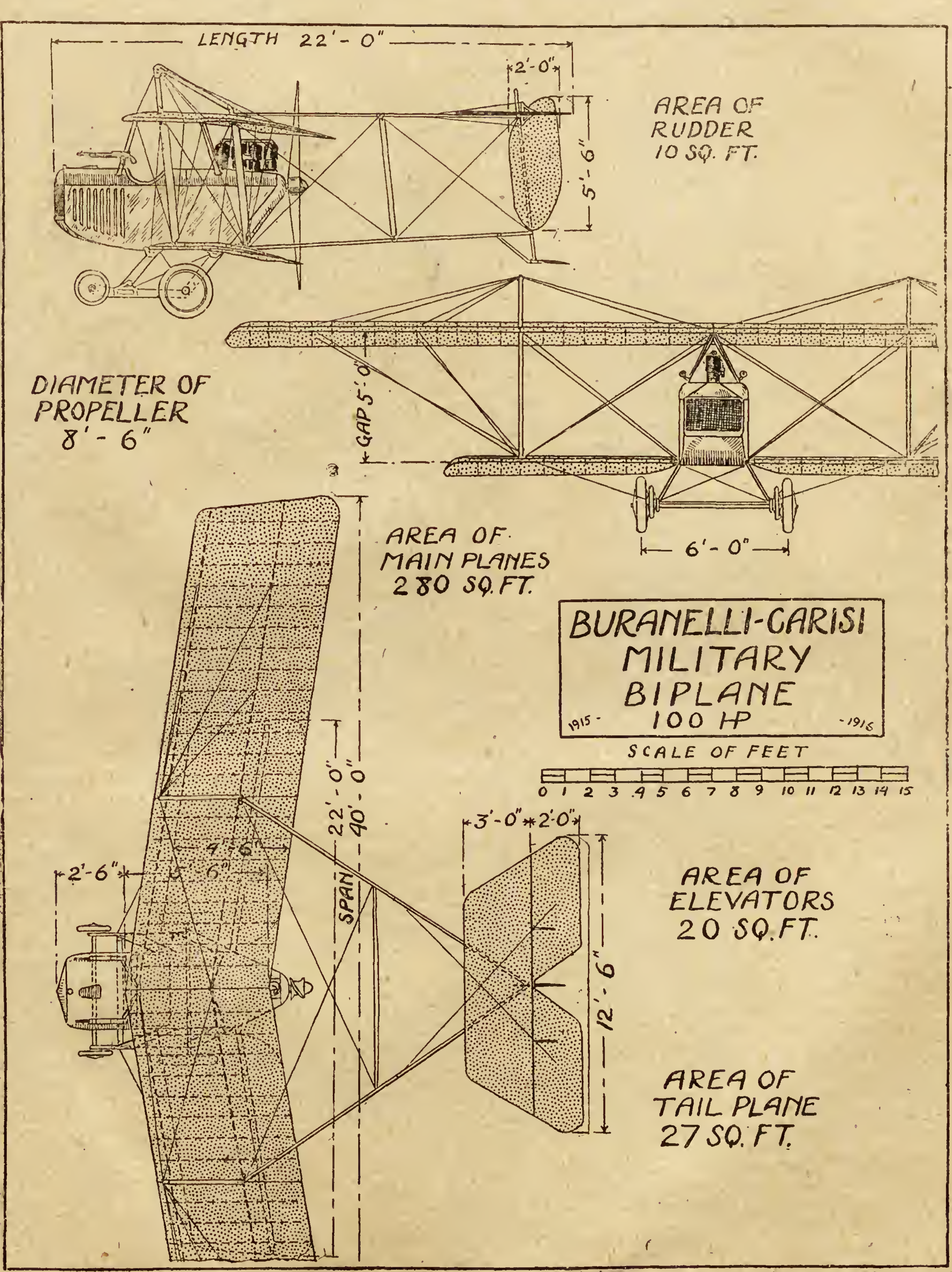
The tail planes are similar in form to those on the Henry Farman, being carried in the same way by four outriggers of 1⅛-in. steel tubing with wood struts, vertical and horizontal. The forward ends of the top outriggers are attached to the top of the upper plane rear spar, just above the interplane strut, and the rear ends come to a point at the vertical post to which the rudder is pivoted. The latter, it will be seen, is slightly staggered forward, somewhat on similar lines to the first Vickers gun-'bus exhibited at the 1913 Olympia Show. The lower outriggers are similarly mounted on the lower plane. The horizontal stabilising plane is mounted on the top outriggers, and has an area of 27 sq. ft. The elevators, measuring 2 ft. by 5 ft., are hinged to the trailing edge of the stabilising plane, one on either side of the rudder, which is of 10 sq. ft. area and partly balanced. The attachment of the stabilising plane is by special fittings which allow different angles of incidence to be made. The construction of the various tail surfaces follows that of the main planes.

The *nacelle* is deep and roomy, and well streamlined. It is built up of stout longitudinals and struts, in such a manner that they serve as bracing members, thereby dispensing with wire bracing. It is about 10 ft. in length, 3 ft. wide and 3 ft. 6 ins. maximum depth. The engine is mounted on strong ash bearers, at the rear. The nose of the *nacelle* is formed by the radiator, which is of the pointed or "Metallurgique" type. Behind are the pilot's and passenger's seats arranged side by side, in front of which is provision for mounting two machine guns. The *nacelle* is covered with Duralumin throughout. Formed integral with the *nacelle*, the fuel tank has a capacity of 40 gallons of petrol, which is force-fed to the engine. The latter is of 100 h.p., having four vertical cylinders, and has been designed by Mr. Buranelli and Mr. Carisi on the lines of the Austro-Daimler engines.

The landing chassis is of the four-wheel type, and appears to be exceptionally strong. The two main wheels, measuring 26 ins. by 4 ins., are mounted under the lower plane, being supported in two stout struts by rubber shock absorbers. Two skids, each connected to the *nacelle* by a second pair of struts, extend from the main wheels, and carry at their forward extremities the two smaller wheels which prevent the machine from turning over on its nose in the event of a bad landing. Both pairs of wheels are mounted on tubular axles, and the skids are connected by a cross strut, which, together with the wire bracing, considerably strengthens the undercarriage.

The control is on Nieuport lines, a wheel, operating the rudder, mounted on a rocking column which operates the elevators, whilst warping is effected by a foot bar.

The calculated speed is given as 40 to 70 m.p.h., and some promising results should be forthcoming from this machine.


LENGTH 22'-0"
2'-0"
5'-6"
AREA OF RUDDER 10 SQ. FT.
DIAMETER OF PROPELLER 8'-6"
GAP 5'-0"
6'-0"
AREA OF MAIN PLANES 280 SQ. FT.
BURANELLI-CARISI MILITARY BIPLANE
1915-
100 HP
-1916
SCALE OF FEET
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
22'-0"
40'-0"
SPAN
3'-0"
2'-0"
4'-6"
6"
2'-6"
12'-6"
AREA OF ELEVATORS 20 SQ. FT.
AREA OF TAIL PLANE 27 SQ. FT.

THE 100 H.P. BURANELLI-CARISI PUSHER BIPLANE.—Plan, side and front elevation to scale.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

New Club Premises.

The arrangements for the alterations, decorations, furnishing, &c., of the New Club House are in the hands of a special Committee and the work is progressing very satisfactorily. There will be a billiard room, smoking lounges, buffet, reading and writing room, dining room and bedrooms. The house is situated within three minutes' walk of the present Club premises.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

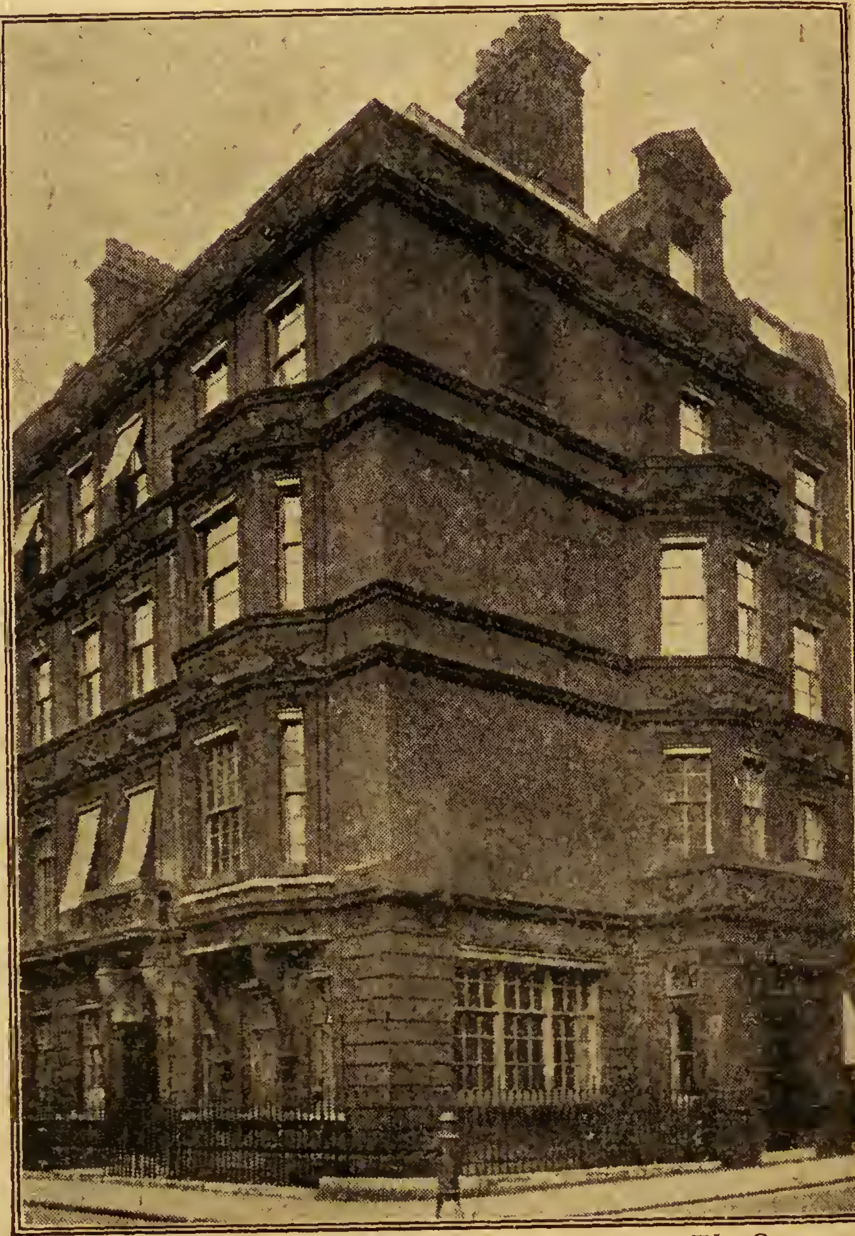
The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Nov. 14th, 1916	10,897	2	4
Employés of Ruston, Proctor and Co., Aircraft Works (Thirteenth contribution)	1	10	0
Collected at the Westland Aircraft Works, Yeovil (Fifty-seventh contribution) ..	0	15	5
Proceeds of Concert given by Ratings of the Royal Naval Air Service at Wormwood Scrubbs and the White City	100	0	0
Total, November 21st, 1916 ..	10,999	7	9

166 Piccadilly, W. B. STEVENSON, Assistant Secretary.



The Car.

No. 3, Clifford Street, New Bond Street, W. The new premises of the Royal Aero Club which will be opened in December.

AVIATION IN PARLIAMENT.

The Royal Aircraft Factory.

Mr. R. Lambert, in the House of Commons on November 14th, asked whether the Royal Aircraft Factory, Farnborough, is a controlled establishment; and, if not, whether the War Office has power to prevent a man from getting his discharge and obtaining work elsewhere?

Mr. Forster: The War Office has the power mentioned in the second part of the question, under an Order made by the Minister of Munitions under Section 7, Munitions of War Act, dated July 14th, 1915.

The Royal Naval Air Reserve.

Mr. Billing asked whether the First Lord of the Admiralty threatened to tender his resignation if the Royal Naval Air Service was included in the recent Air Inquiry; and whether the Lords of the Admiralty have threatened to tender their resignation if any steps are taken to remove from the sphere of their control the Royal Naval Air Service?

The Prime Minister: The answer to both parts of the question is in the negative.

Report on the Air Board.

Captain Bennett-Goldney asked the Prime Minister whether he will in due course order that the Report of the Air Board shall be laid upon the Table of the House, or, if this course should be considered inadvisable on military grounds, if members will be given an opportunity to see it privately, or, if necessary, to hear its contents during the proposed Secret Session?

The Prime Minister: The first Report by the President of the Air Board is a document of a highly secret character. So far as my own knowledge and responsibility extend, its contents have only been communicated to members of the War Committee, and are engaging the Committee's close attention. The Report embodies certain proposals and recommendations affecting at least three Departments, the Admiralty, the War Office, and the Ministry of Munitions, whose considered views on those recommendations have yet to be submitted to the War Committee. I hope to be in a position shortly to make a statement to the House on the subject. I certainly do not think it desirable that the Report in its entirety should be laid on the Table. I am not prepared at present to state whether or not it is advisable that the Board's proposals should be discussed in Secret Session.

Mr. Billing, on November 16th, asked if it is proposed to lay Lord Curzon's Report on the Air Service upon the Table of the House?

Mr. Bonar Law: I would refer the hon. member to the written answer I gave to the hon. member for the Canterbury Division on the 14th inst., to which I can add nothing.

Mr. Billing: Can the right hon. gentleman say at what time it is likely that this Report will be considered?

Mr. Bonar Law: By the House?

Mr. Billing: No, by the Government.

Mr. Bonar Law: Certainly at an early date—next week at the latest.

Mr. Ashley: May we not at least have this Report before the debate on the powers of the Air Board?

Mr. Bonar Law: I think not. It was a very confidential document.

Naval Anti-Aircraft Corps.

MR. GLANVILLE asked whether the conditions of Service men enrolled in the Naval Anti-Aircraft Corps involving duty on alternate days only are liable to alteration without the men having the opportunity to resign from the corps; and whether the men can be transferred to any other arm of the Service or of the Army without their consent?

Dr. Macnamara: The Anti-Aircraft Corps is being brought into line with all other branches of His Majesty's Service according to the terms of the Military Service Acts. All men of military age are being medically examined, and as the number of men in the corps exceed the number required, men will be given their discharges in accordance with their medical classification, commencing with Class A. No guarantee can be given that men retained in the corps who are liable to serve under Military Service Acts will in future only be employed every other day or night as in the past. They will perform the same amount of duty as the military who man the remainder of the London Anti-Aircraft defences. The amount of duty performed by the men over military age who are volunteers will remain as in the past, but the hours may be slightly adjusted if it can be arranged. There will be no question of transference to any other arm. Men not required will be given their discharge, and their names forwarded to the Director of Recruiting. He, however, has been requested to allow men who have been in the Anti-Aircraft Corps to join the Artillery if they prefer it to any other arm of His Majesty's Forces.

Sir C. Henry, on November 15th, asked the Secretary of State for War the number under the age of 30 at present engaged in the Anti-Aircraft Service in this country; and whether it is the intention to transfer men suitable for active military service from this branch, and to replace them by men who it has been decided are not eligible for active service?

Mr. Forster: The process of replacing men fit for general service by Home service men is being carried out. Such a substitution must, however, be a matter of progressive adjustment as the substitutes become sufficiently trained.

Fatal Accidents in the R.F.C.

MR. BILLING, on November 16th, asked how many airmen belonging to the Military Wing, Royal Flying Corps, have been killed in this country during the last 12 months whose deaths may be attributable to preventable or unpreventable accidents?

Major Baird: The total number of fatal accidents from all causes in the Royal Flying Corps, Military Wing, in this country in the last 12 months is 98.

* * *

Another Military Aerodrome for Japan.

ARRANGEMENTS have been completed by the Japanese military authorities for a new aerodrome at Kagami-gahara in the Gifu prefecture. The ground has an area of about 72 acres, and it is expected that a battalion of the Japanese Flying Corps will take up its quarters there in the New Year.

A Japanese Aero Motor.

THE prize of 20,000 yen offered by the Imperial Aero Society of Japan for the most practical aeroplane motor in Japan has been awarded to Mr. Shimadzu Narazo, of Osaka. No details are yet to hand with regard to the design. The presentation ceremony in the Uyeno Park was attended by Prince Kuni, the Marquis Okuma, &c.

GERMAN OFFICER PILOTS WHO HAVE BEEN RECIPIENTS OF SOME OF THE 430,000 ODD IRON CROSSES SAID TO HAVE BEEN DISTRIBUTED.—Attention has been drawn frequently to the prodigality with which Iron Crosses are showered broadcast among German officers, but it is a popular mistake to compare the Iron Cross with our Victoria Cross. As a matter of fact, it would be more correct to say that the Iron Cross corresponds to our Distinguished Service Medal, or to the French "Medaille Militaire." That German pilot officers have reaped a large share of the coveted recognition is evident from the accompanying photographs, which have appeared in *Flugsport*. In the above illustration the pilots are, reading from left to right: Lieut. Behl, Lieut. Stabl, Lieut. Vierling, Lieut. Sendel, Capt. Stadelmeyer, Lieut. König, Lieut. Hailer, and Lieut. Schlemmer. Inset, Capt. Karl Albrecht.

ARMCHAIR REFLECTIONS.

by the "Dreamer"

WHEN I buy those little penny magazines for women at the bookstall, which I do sometimes, finding them interesting reading, I take care that I am unobserved by any but the stall attendant. An insatiable appetite for reading places me in the position of being able to digest anything except a railway timetable, and the pretty covers of these assuasive—or is it augmentative?—components of female romance, latent or active, will generally wheedle a coin from my pocket.

At home by my fireside, where there are none to discover me in my inquisitiveness *re* matters feminine, I may read at my pleasure. Not that I am interested in the latest in that which is spelled lingerie, whatever its pronunciation. It is the stories that have an attraction for me, in that they are written in a style, and with a delightful disregard for anything approaching feasibility with regard to relative possibilities entirely outside the ability of mere man to imitate.

I say this advisedly, because it seems pretty clearly established by the context of these stories, that feminine imagination is behind the pen that gives them birth. A man does not speak of any one of his fellows as a *nice* man, although he may err in his selection of an adjective when one of the opposite sex is in his eye. A woman writer will cheerfully so prefix both, and when she brings both sexes with the same appellation into one story I can settle down comfortably in my chair and await developments.

"Sybil sat by the silent stream in deep soliloquy." The art of story-writing is to grip your reader's interest in the first sentence. As the title of the story led me to suppose something embracing aviation, I was just a little disconcerted, but my interest was gripped precisely as intended a few lines lower, when, "throwing her head back, and stretching both arms to heaven, she cried in sweet, dulcet tones, 'Oh, I love him, I love him!'"

Now when a sweet little bundle of prospective bliss throws her arms on high and yells her inmost secret to any one of the four winds of heaven that may be in evidence at the moment, there is something in the air. And there was. The mysteries of the transference of information by the native tribes of India were as nothing to this magic call of love, for she was calling to her aviator lover on duty in far-away France. "Hardly had the words passed her lips when her prayer was answered. The hum of an aeroplane throbbed through the air, and settling light as a bird, her lover was soon by her side." There are some of us old enough to be able to venture the opinion that when an outburst like the above takes place with ourselves as the objective, it is not so much a prayer as a declaration of hostilities. But what I am most concerned with—and I shall certainly endeavour to get someone I know to ask the question where such questions are asked—is, how is it that service pilots use service machines to fly from France on week-end visits to dimples and blushes by silent streams in "far-off Devon"—(Devon is always "far off," wherever one may be); and whether the Hon. Member will undertake to give an undertaking under the D.R.A., having in view the possible shortage of petrol, that service machines shall not in future be used for these purposes, and whether the said pilot did or did not fill in form 0001A, before doing as he ought not to have done? I say I know someone who may place these questions, with others of equal momentous import, where such questions receive "the consideration they deserve."

But Sybil was coy. Having got what her little heart most yearned for, she spun about like a biplane with a shortage of tail area and asked him "how he dared?" Nor would she promise anything definite in the way of possessive privileges until he had returned whence he came and brought back her only brother, who years ago had guyed with the family cashbox or something, to a forgiving father.

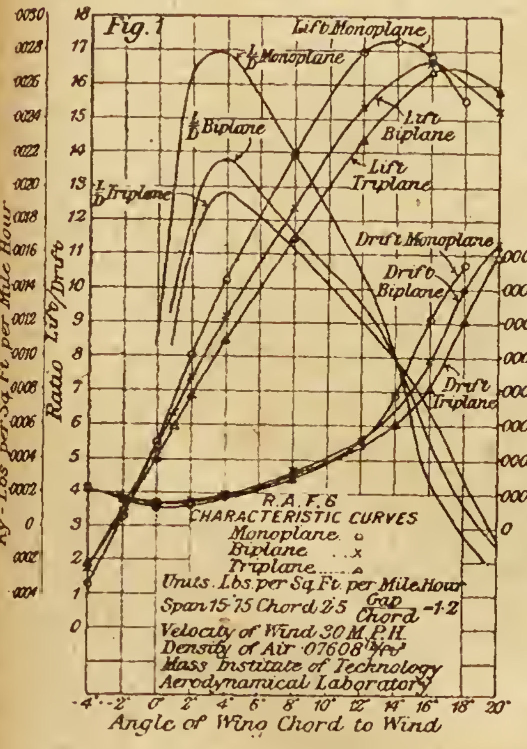
Back he went to France, without filling in any forms or performing any frillings, "on his lonely quest." Personally, I cannot conceive a lonely airman flying all over France with his eyes on the ground seeking a young blood who had mistaken the old man's banking account for his own. Doubly hard would it be, for the simple reason that the absconding one might have very reasonable grounds for not wanting to be found. However, it is on the authority of the authoress that "three weeks later, there landed at Southampton" (Plymouth would have been nearer) "two men who bore the gift of joyous life upon their sunburned faces," & etcetera, and so forth. By rights there should have been three men, and one should, like Eugene Aram when he set out from Lynn, have "walked between, with gyves upon his wrists," but this would have killed the story and considerably discounted the hero's chances of future hapipness.

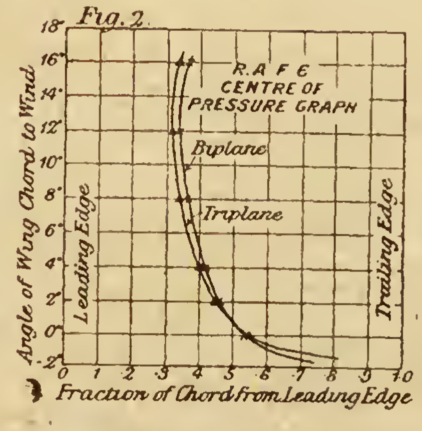
So the story went the way the writer intended it should go, and the pair turned up at the paternal residence prepared for a good large helping of the fatted calf. Turned up in the nick of time too, by all accounts, for the mother was bathing her daughter's forehead with vinegar water or something, she having repented driving her lover to what might be his death, and having gone into a decline of some sort accordingly in orthodox manner. The old man pretended to be obdurate, and swore it was no wish of his that Egbert should ever set step over his threshold again, but the daughter forgot her decline to the extent of putting her two arms about his neck and snuggling down as women know how to snuggle. Then he cried and said "My boy, my boy!" and Sibil snuggled the other Johnnie and said "My man, my man!"

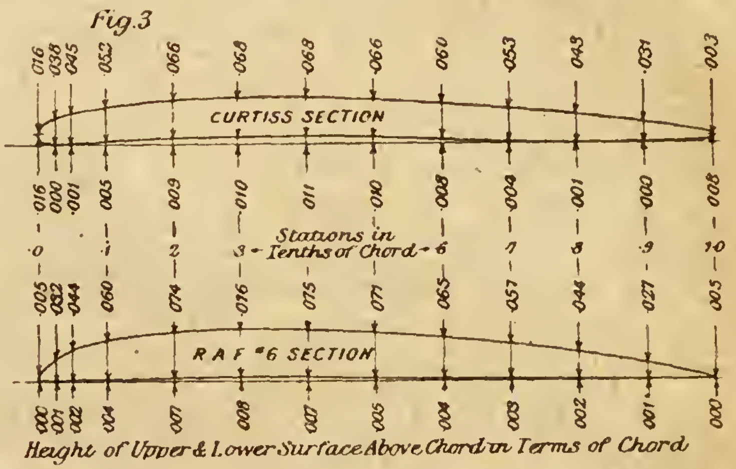
AERODYNAMICAL PROPERTIES OF THE TRIPLANE.*

By J. C. HUNSAKER, Eng. D., and T. H. HUFF, S.B.

General Problem.—The demand for increased size and weight of aeroplanes, especially seaplanes, must be met without material increase in the landing speed. On this account the wing loading remains at about 5 lb. per sq. ft., and for an aeroplane of fourfold the ordinary weight the wing area must be increased in like proportion. Monoplane construction is obviously impractical for such great spread of wings, and even the customary biplane arrangement leads to a span from tip to tip of wings of over 100 ft. The difficulty of handling and housing such a great structure has led to the consideration of wings in a tier of three, or a triplane, to provide the wing area necessary to sustain a great weight at a speed of not more than 50 miles per hour, and at the same time not unduly to extend the span.







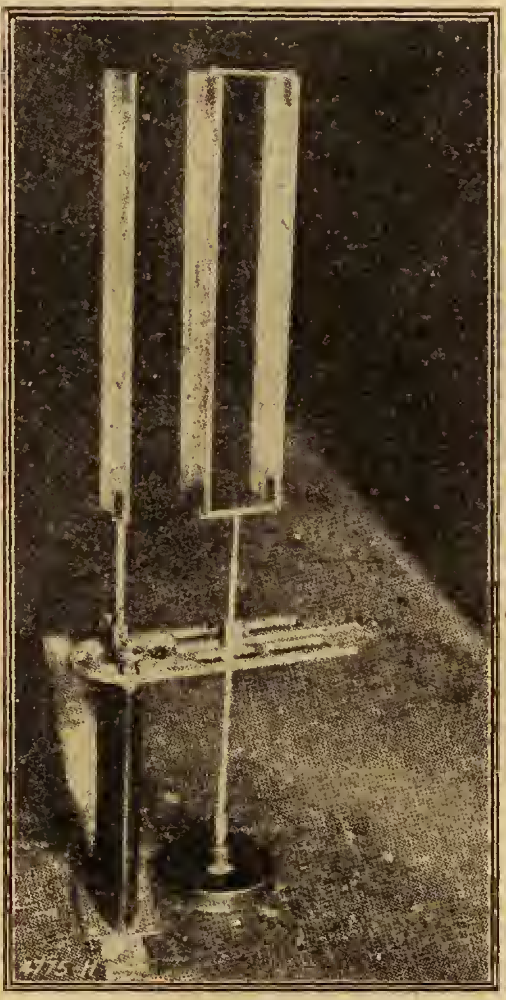
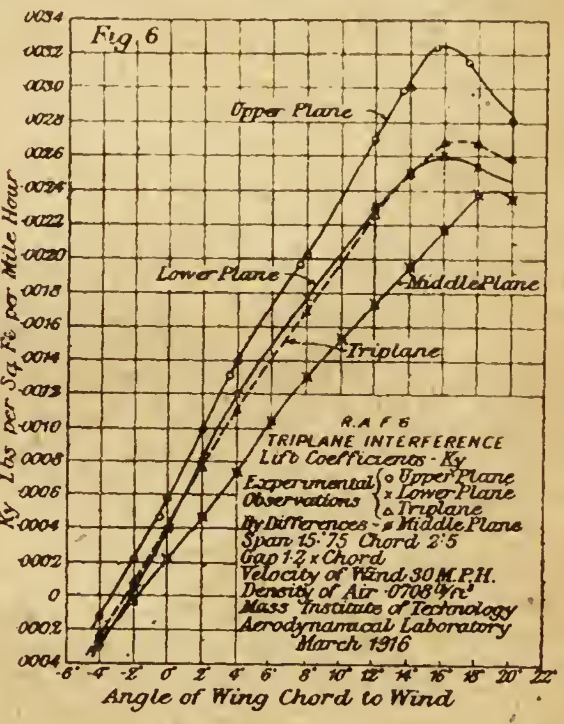
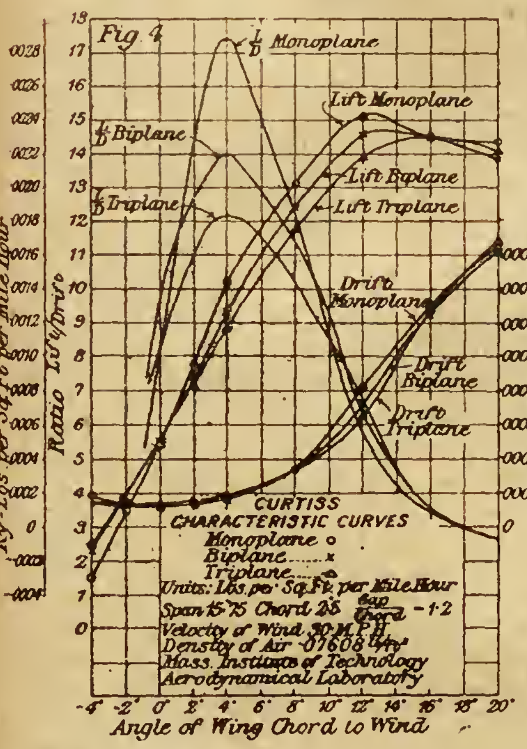


Fig. 5.





The following aerodynamical investigation was undertaken to determine the suitability of the triplane arrangement for weight-carrying as compared with the biplane. It appears that the triplane is not so effective as the biplane, and will require somewhat more power to drive; but with sufficient power the triplane can support nearly the same weight as the biplane at its attitude of maximum lift. The loss is only about 1·1 per cent. At small angles near 4°, for the same lift the triplane requires some 6 per cent. more power than the corresponding biplane. At 4° incidence the ratio of lift to resistance is 13·8 for the biplane against 12·8 for the triplane.

Experiments on R.A.F. 6 Profile.—The experiments were conducted in the Wind Tunnel of the Massachusetts Institute of Technology, on wing models made of laminated maple scraped to a profile known as R.A.F. 6† to the nearest 0·005 in. Each aerofoil was 15·75 in. span by 2·5 in. chord, giving an aspect ratio of 6·3. The models were all tested at a wind velocity of 30 miles per hour; air density, 0·07608 lb. per cub. ft.

Models were mounted vertically on a spindle, with necessary bracing in a manner described previously.‡ In every case the effect of the supporting apparatus has been determined by separate tests and subtracted, as well as the effect of such struts or wires as were used to ensure parallelism in the biplane or triplane combinations. The results here recorded therefore, apply to the bare aerofoils only.

Biplane and triplane models had a constant gap between planes equal to 1·2 times the chord length, and there was no stagger or overhang.

A single aerofoil was first tested as a monoplane to serve as a standard for reference. The lift and resistance, or "drift," are expressed as lbs. per sq. ft. wing area per mile hour velocity. The coefficients found are in fair agreement with previous tests upon aerofoils of this section made both at Teddington and at this place. The precision of measurements in our wind-tunnel work is better than 1 per cent., but minor variations in workmanship of model, too slight to be detected, may lead to discrepancies of the order of about 3 per cent. between the results of tests on two apparently identical models.* The "centre of pressure," defined as the intersection of the line of action of the resultant force on the aerofoil with the plane of the chord, has been found by a graphical construction from the observed force components and the moment about the supporting spindle. In the biplane tests the centre of pressure is taken in the plane parallel to and midway between the planes of the chords of upper and lower wings, and in the triplane tests the centre of pressure is referred to the plane of the chord of the middle wing.

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* By courtesy of *Engineering*.

† Technical Report of the Advisory Committee for Aeronautics, 1912–13, London.

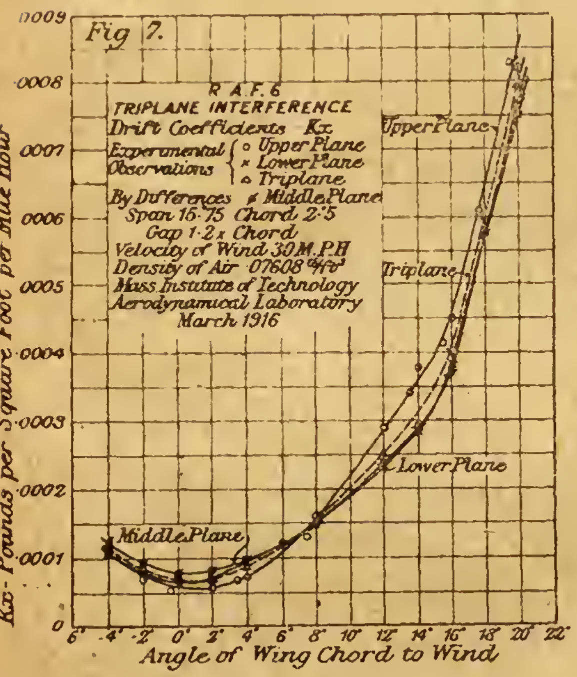
‡ "Stable Biplane Arrangements," *Engineering*, January 7th, 1916, page 1.

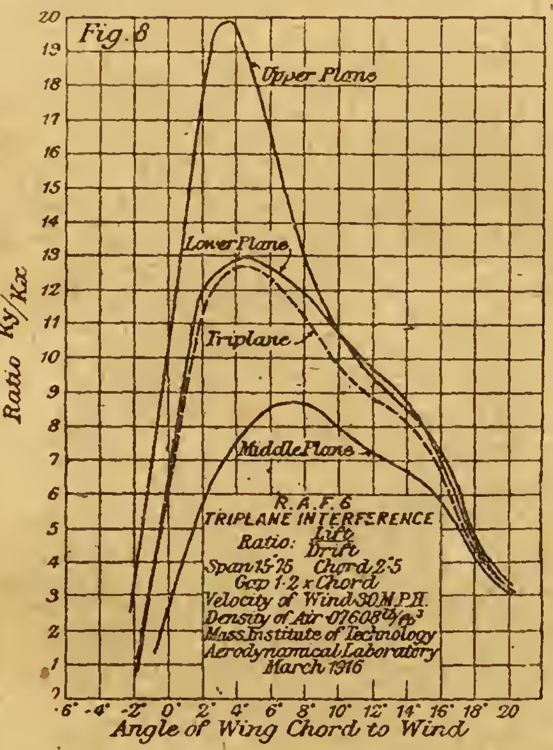
The curves for lift coefficient K_y and drift coefficient K_x, defined by

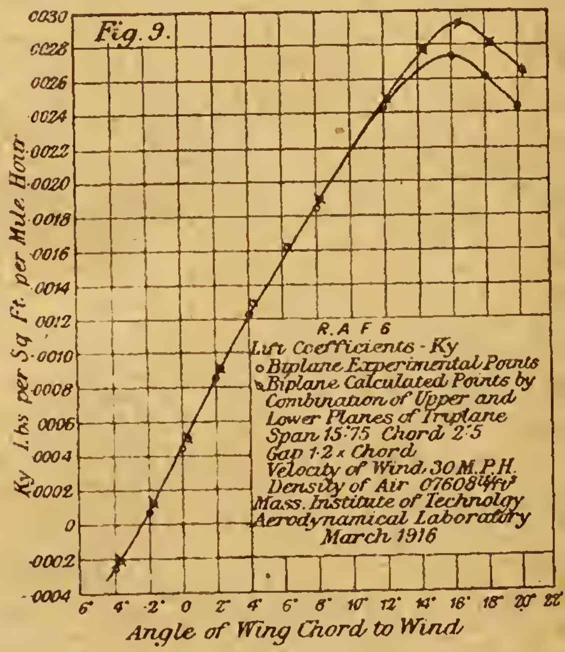
$$\text{Drift} = K_x \, S \, V^2$$
$$\text{Lift} = K_y \, S \, V^2$$
$$\text{(lb.) (sq. ft.) (miles/hour)}$$

are plotted in Fig. 1 with the angle of incidence between the chord and wind direction as abscissæ. The coefficients calculated as above from the observed forces are plotted to show the consistency of the observations.

It appears by comparison of the lift curves for the three cases that the triplane and biplane give nearly the same maximum lift at about 16°, but that for smaller angles of incidence the triplane lift is appreciably reduced. Confirming previous tests on biplane *versus* monoplane, we find the lift coefficient for the monoplane superior at all angles above zero. The drift coefficient for angles below 12° is not greatly different in the three cases, but at very great angles of incidence near 16°, the triplane has a materially lower resistance, and has a real advantage in such a "stalling" attitude.







The curves of ratio lift/drift bring out the relative effectiveness of the wings. Thus the best L/D ratio is 17 for the monoplane, 13·8 for the biplane, and 12·8 for the triplane. These values refer to small angles of attack corresponding to high flight speed. For a large angle of attack, 16°, the ratios are respectively 4·5, 5·6 and 6·5.

The centre-of-pressure curves are plotted for biplane and triplane in Fig. 2. It does not appear that the centre-of-pressure motion is changed in character in going from biplane to triplane. In a previous article in *Engineering*† we showed that the centre-of-pressure motions for the monoplane and for the biplane were nearly identical. The present experiments confirm this conclusion, but the monoplane curve is omitted for the sake of keeping the figure clear.

The annexed table of experimental points brings out the relative values of the coefficients in the three cases taking the monoplane coefficients as standard, and expressing those for the biplane and triplane as a percentage of them.

	Monoplane.		Biplane.		Triplane.	
i.	Actual.	Percentage.	Actual.	Percentage.	Actual.	Percentage.
	K_{ym}.	K_{ym}.	K_{yb}.	K_{yb}.	K_{yt}.	K_{yt}.
0	·000486	100	·000432	88·8	·000404	83·0
2	·00103	100	·000864	83·8	·000776	75·4
4	·00145	100	·00123	85·4	·00109	75·7
8	·00218	100	·00186	85·2	·00169	77·4
12	·00278	100	·00244	87·6	·00226	81·2
16	·00277	100	·00273	98·5	·00267	96·4
	L/D	L/D	L/D	L/D	L/D	L/D
0	8·6	100	6·3	73·2	6·1	70·8
2	16·3	100	12·2	74·7	11·4	69·8
4	16·8	100	13·8	82·0	12·8	76·1
8	13·8	100	11·3	81·9	11·1	80·4
12	10·0	100	9·5	95·0	8·9	89·0
16	4·5	100	5·6	124·0	6·5	145·0

It may be noted that the drop in lift after passing the maximum is less rapid for the triplane than for the other combinations. The advantage here, if any, is of slight importance, because aeroplanes ordinarily cannot be operated at such great angles of incidence.

Experiments on Curtiss Profile.—To verify the tests just described the work was repeated for a monoplane, biplane and triplane made from an aerofoil cast in type metal, having a profile similar to that at one time employed by the Curtiss Aeroplane Company. This profile differs from the R.A.F. 6, shown in Fig. 3, by the thickness of the edges.

These Curtiss aerofoils were made of the same over-all dimensions as the R.A.F. 6, arranged, as before, with gap 1·2 times chord, and tested in an identical manner. The results for the monoplane, biplane, and triplane are shown in Fig. 4. These curves are of the same general character as those for R.A.F. 6 given in Fig. 1. We have then confirmation of the conclusions that:—

1. The maximum lift of the triplane is very nearly as great as that of the biplane.

2. At angles of incidence between 2° to 12° the lift and ratio L/D of the triplane are materially less than the corresponding values for the biplane.

Applied to an aeroplane, we should expect to obtain about the same landing speed on given wing area, whether the biplane or triplane arrangement were used. The maximum speed for given engine power would, however, be less for the triplane on account of lower L/D ratio at small angles.

Interference.—Experiments were next undertaken to determine the distribution of load upon the three wings of the triplane made of aerofoils of R.A.F. 6 profile. A special apparatus was designed (Fig. 5) by which two wings of the combination could be supported independently in their proper attitude, while the remaining one was attached to the balance, and its characteristic coefficients found by experiment. It was convenient to measure the lift and resistance components for the upper wing and for the lower wing, as influenced by the others, and then to find the forces on the middle wing by subtraction from the values previously found for the complete triplane.

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* Smithsonian Miscellaneous Collections, vol. 62, No. 4, "Characteristic Curves for Wing Section, R.A.F. 6."

† See *Engineering*, January 7th, 1916, page 1.

The results are shown by the curves of Figs. 6, 7 and 8.* It appears that the upper wing is very much the most effective of the three, and that the middle wing is the least effective. The coefficients for the lower wing are very nearly those for the three in combination as a triplane.

To estimate the lift on each wing for use in structural design of the wing girder, we give below a table showing the lift and ratio lift/drift of each wing in terms of the corresponding values for the middle wing taken as unity.

The very poor lift of the middle wing must be caused by interference with the free flow of air due to the presence of the upper and lower wings. It would be reasonable to suppose that the middle wing influences the lower wing to the same degree that the upper wing of a biplane influences the lower wing, and that it influences the upper wing of the triplane to the same degree that the lower wing of a biplane influences the upper wing of that combination. Consequently, if this reasoning hold, we should expect the sum of the observed lifts on the upper and lower wings of the triplane to be equal to the observed lift on the biplane R.A.F. 6 previously tested.

Angle of Incidence.	Lift Upper.	Lift Middle.	Lift Lower.	L/D Upper.	L/D Middle.	L/D Lower.
0	2·68	1·0	1·82	3·63	1·0	2·30
2	2·14	1·0	1·76	3·18	1·0	2·13
4	1·91	1·0	1·64	2·59	1·0	1·69
8	1·56	1·0	1·36	1·49	1·0	1·37
12	1·56	1·0	1·31	1·30	1·0	1·34
16	1·49	1·0	1·20	1·22	1·0	1·17

The observed biplane lift coefficient and the hypothetical biplane lift coefficient, calculated from the sum of the lifts on upper and lower wings of the triplane are plotted in Fig. 9. It appears that for all angles below the critical angle, where the lift coefficient drops off, the discrepancy is slight.

For a given wing profile there is a definite angle of no lift. Our method of measuring wind direction in these experiments admits of a precision of about 0·25°. Since all of our curves are plotted on angle of incidence as abscissæ, they may be moved bodily to right or left 0·2° and still express the results within the limit of precision of the experiments. It has been found necessary to correct the lift curve for the hypothetical biplane in this manner by moving it to the right 0·25° in order to give the same angle of no lift.

The lift coefficient at 16°, the critical angle, is very difficult to determine with any certainty on account of the unstable nature of the fluid motion at this angle. Violent eddy-making begins here, and the balance tends to oscillate unless heavily damped. Excepting at the critical angle, the lift coefficients observed for the biplane and calculated for a similar biplane from the lift on upper and lower wings of triplane, are in such good agreement that we conclude that the curves of Fig. 9 furnish the check and verification desired.

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* Lift/drift plotted from faired curves.

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Woman's Long-Distance Flight in U.S.A.

A CABLE message from New York on Monday stated that Miss Ruth Law has created a non-stop flying record by covering 590 miles at an average speed of 103 miles an hour. The previous American cross-country record was 452 miles. Miss Law started from Chicago with the purpose of reaching New York, but had to come down at Governor's Island through lack of petrol. She used a Curtiss Biplane.

The R.F.C. and Captain Boelcke.

AN official telegram from Berlin states that on November 11th an aviator dropped a wreath in the German lines on the Somme to which was attached the following note :—

"In memory of Captain Boelcke, our brave and chivalrous enemy.—The Royal British Flying Corps."

An accompanying letter read :—

"To the officers of the German Flying Corps at this front. We hope you will find this wreath. We regret that it comes so late, but the weather prevented us from sending it earlier We mourn with his relatives and friends. We all acknowledge his bravery. Please remember the Morane Squadron to Captain Evans and Lieutenant Long."

The wreath and the messages have been sent to the parents of Captain Boelcke.

The French Raid on Munich.

THE expert French commentator writes on November 18th with regard to Capt. Beauchamp's flight over Munich :

"Leaving France in the morning, he flew in broad daylight as far as Munich, where he brought terror to the capital of Bavaria, successfully dropping several bombs on the station.

"Thus the innocent victims of the last bombardment of the open town of Amiens by the Germans have been avenged. Then, turning at right angles towards the south, he flew over the whole of the Tyrol and crossed the Alps to land at length 12½ miles north of Venice in the village of Santa Dona on the small River Piave, having journeyed without stopping a distance of 700 kilometres (437½ miles).

"This daring raid proves the mastery which the French air service henceforth possesses, both from the point of view of the quality of the machines and of the ability of the pilots.

"Perhaps in the future the fear of punishment will make the Germans observe the rules of humanity."

The Raid on Padua.

THE Austrian air raid on Padua has drawn from the Pope another strong protest to Austria recalling his former pronouncements against such a brutal system of warfare, which has no military purpose, and only causes suffering to the innocent and unarmed civil population.

Some details of the raid are given by the *Messagero* as follows :—

"The bombs fell in thickly inhabited districts of the town, but, generally speaking, without much hurt to life or property. One very powerful bomb caused havoc at a spot where about 100 people of the poorer classes, mostly women and children, had sought safety in sheds, having been prevented by the flooding of the Brenta from proceeding to the caves in which they are wont to find refuge. Bursting in their midst, the bomb strewed the ground with shapeless forms, buried beneath the débris of the buildings. By the light of torches the work of rescue was at once undertaken. Up to the present 31 dead bodies have been found—11 men and 20 women."

The German Air Service Reorganisation.

APPARENTLY the "experiment" of placing the German army flying services under one department, which commenced in March last, has justified itself. It is now announced from Berlin that the increasing importance of aerial warfare has made it necessary to combine under one board the entire aerial and anti-aircraft forces of the army in the field and at home.

The uniform development and preparedness of these services have been entrusted to the General in command of the aerial forces. Lieut.-General von Hoeppner, who up to now has been in command of a reserve division, has been appointed General in command of the aerial forces.

German Thoroughness Again.

THE raid on Munich by Capt. de Beauchamp evidently set the German regulation-makers to work, as the *Munchener Neueste Nachrichten* on the following day printed the following police notice in heavy type :—

"Since, in spite of the bad weather, further aerial attacks may be expected, the people are reminded of the precautions to be observed in case of danger." Then follows a series of 93 paragraphs, setting out in detail all manner of precautions to be taken.

Another police notice warns the public that during the day the military authorities will explode one of the bombs which did not go off on falling to the ground.

Another Super-Zeppelin.

IF the *Thurgauer Zeitung* is to be credited a new super-Zeppelin has recently been tried over Lake Constance. As far as could be seen from the Swiss shore, the airship has four gondolas, under the foremost of which was suspended a small car apparently intended to be lowered for observation purposes.

It is stated that a defensive armament is installed in chambers built in the sides of the envelope. It is also asserted that at the stern of the vessel was suspended an aeroplane which, on being released, flew away inland.

Russians Bag a Zepp.

ACCORDING to a Reuter message dated November 18th, from Petrograd, the Russians have brought down a large Zeppelin on the south-west front near Sarny. It is stated that they captured the crew of 16, three guns, two machine guns, and nearly 300 kilogrammes (6 cwts.) of bombs.

AIRISMS FROM THE FOUR WINDS

Captain de Beauchamp's 437 mile bombing expedition to Munich and back to Venice was carried out on a British machine.

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After all there appears to be nothing in the accusation that electric trams and railway trains give the direction and locality to vagrant Zepps. According to Field-Marshal Commanding-in-Chief of the Home Forces, Lord French, it is confidently believed that it is only necessary to assure the public that the continuance of railway and tramway traffic does not serve as a guide to hostile aircraft, and is of vital importance for the successful prosecution of the war, for them to accept the decision and co-operate in carrying it out with loyalty and patriotism.

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Coming from Lord French it *should* be all right, but we hardly follow the *sequiter*. Perhaps if it were put too plainly the enemy might get some tip from it. At least from this pronouncement it would seem as if all the elaborate drawing of railway blinds and the dimming of train lights have been wasted efforts.

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Government sea freight insurance and aircraft raid or bombardment insurance are two separate entities. Where the one leaves off the other starts. Which those who have bits and pieces under consignment across the seas would do well to remember, in case they have not taken out the two covering policies. Directly the goods are out of the ship, should an enterprising Zepp. crew play havoc with them, without the aircraft policy, there'll be nothing doing in the way of compensation. So the only alternative to an air-risk policy is to be ready to tumble the goods back into the ship's hold directly a Zepp. raid alarm is given. Which means some hustle. For ourselves we shall risk the investment in the dual policy scheme.

Mr. Sydney Pickles leaving St. James's Church, Piccadilly, last week, with his bride, after the ceremony in the church. Inset is a reflection of the beautiful bride, whose face in our other photograph is unfortunately obscured by her bouquet.

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The final report of the Air Inquiry which was presided over by Mr. Justice Bailhache, has been in the hands of the authorities for a week or more.

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A couple of bars to the D.S.O. is a record to be proud of, on the top of the Military Cross. Heartiest of congratulations to Capt. Albert Ball, Sherwood Foresters and R.F.C., the possessor of these distinctions, upon his investiture by the King last week.

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Lieut. Roderic Hill, whose very beautiful drawings have been such a feature in the pages of "Flight" in more peaceful times, has again distinguished himself at the front. Since he returned wounded from the front many months ago, and after he joined up with the R.F.C., he has gone through many a good strafing job, and for one of his latest stunts in this direction he has been awarded the D.S.O., his name appearing in our columns this week from the *London Gazette* of November 14th.

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Confetti thrown from an aeroplane last week was the manner of greeting from his fellow pilots to 2nd Lieut. Charles H. Bell, R.F.C., some time instructor at Hendon Aerodrome, after his marriage at Hendon Parish Church to Miss Daisy Sloan.

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The conquest of the air is revolutionising many preconceived ideas and things in this material world of ours. Through generations it has never been found possible to imbue into the minds of the common or garden pedestrian that by adopting the simple formula of always, within reasonable limits, keeping to the right when passing other folk, the pavement traffic of our streets would get along ever so much more smoothly than the present method of incessant banging against and dodging of one's fellow creatures. The bump of congenital perversity is no doubt prominent in most people of to-day, but the drastic necessities enforced by the present anti-Zepp. illuminating regulations to ensure a safe passage along our thoroughfares at night, may well bring about as a regular habit, what a century of mild request has failed to accomplish. We frankly welcome the notice, therefore, of the Commissioner of Police drawing attention to the fact that "keep to the right" *is* a recognised rule of the pavement. Our only regret is that there is not some sort of penalty for the roaming idiot who will still insist upon meandering zig-zag across the stream of traffic. That and the casting down haphazard of banana skins should be made criminal in a single clause.

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Success in securing exhibits of surpassing interest has compelled Lady Drogheda to postpone the opening of the exhibition of paintings, prints and photographs of aircraft, past and present. The arrangements entail a deal of labour, and it was, moreover, found that Messrs. Knoedler's gallery in Bond Street was all too small, so that a larger gallery has had to be sought for, and the opening day will be announced presently. Being for the benefit of two such noble funds as the Flying Services Fund and the Irish Hospital Supply Depôt work for the British Red Cross, should ensure generous support to Lady Drogheda's well-conceived scheme.

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Would it have been such a dire calamity after all had the City Fire Brigade, in the event of a Zepp. raid, as suggested by Chief Inspector Hewitt would be the case, smashed up those Gog and Magog bells which bang out their monotonous "tunes" four times an hour, year in and year out? £20 under the conditions of their ringing at night, contrary to the regulations, was a light get-off for the offending company, Sir John Bennett, Ltd., and we would not be surprised to hear that the offenders' neighbours in Cheapside would gladly add another like sum if, upon the next visit of the Zepps. to this country, occasion may be found for the fulfilment of Chief Inspector Hewitt's threat. When Sir John passed away, his *chef d'œuvre* might well have passed with him.

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Another stunt from America is the shooting of wild ducks from aeroplanes. Long Island is the spot where the sport will be in progress during the duck shooting season, and it should prove great practice for aerial gunners and pilots to endeavour to follow the manœuvres of these very dodgy birds, and bring them to table. Our lower east coast should put up some good sport in this direction for those of our pilots lucky enough to be in the vicinity.

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The London correspondent of a Midland paper, speaking of a machine he saw land in a field near him, says he noticed the number on it was close on 3,000, "and that turned out by one firm only amongst all those engaged in the manufacture of aeroplanes. Then there are the Government factories as well." And concludes by saying, "The total figures should make cheerful reading." In this ratio they certainly should.

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Looking remarkably fit considering the strenuous time he has had during the past few months, and with his honours thick upon him, Sous Lieut. Louis Noel has honoured England by making a bee-line for London to enjoy a few weeks' leave. His holiday has been most thoroughly earned by the hero of the recent Salonica–Sofia–Bucharest bombing expedition.

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Whether they are all anxious to become aviators or not, there has been an epidemic recently of boys sliding down the Brooklands track behind the aeroplane sheds. Fourteen have recently been before the Woking magistrates charged with being on War Department land without a permit; it cost the three eldest 5*s*. each, and the rest were told not to do it again.

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It is reported that white dogs on leads are being utilised in "Darkest London" by pedestrians with defective sight as a means of giving notice of approach and thereby preventing collisions with passers-by. Lurchers are unpopular. —*Motor News.*

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The announcement of the Secretary of State for War this week relative to the presentation of decorations to the next-of-kin of fallen officers and men, would not have been necessary if the editors of daily journals would read their "Flight." But what about the posthumous *award* of decorations? Haven't the "difficulties" been overcome yet? Mr. Lloyd George had better get a move on, since the best authorities say the war can't possibly last more than another three years.

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal*) *of November*, 1906. "Flight" *was founded in* 1908.

£10,000 for an Aeroplane Flight.

The event of the week, unquestionably, is the offer made by the *Daily Mail* of a magnificent prize of £10,000 for the first aeroplane to fly from a point starting within a radius of five miles of the *Daily Mail* office in London to any other point within the same radius of the *Daily Mail* office in Manchester. No stipulations have been attached to the munificent offer, except that the competition will be confined exclusively to aeroplanes, and that the competitors must be members of some recognised aeronautical club.

The Brothers Wright Awake.

According to our contemporary, *Les Sports*, a letter has been received by the French Aero Club from the brothers Wright, containing statements which may be regarded as truly remarkable. It would appear that during the past year they have not been flying at all, but have devoted the whole of their energies to developing a lighter and more suitable motor for use with their aeroplane, and now claim that they have produced a motor giving 28 h.p. and weighing about 3 kilogs. per horse-power. This is much more powerful than the motor they previously employed, and they estimate that they will be able to carry two men with it, and to travel at 70 kiloms. per hour.

The French War Office Airship "La Patrie."

The great airship "La Patrie," which has been built by the Brothers Lebaudy to the plans of M. Julliot for the French War Office, made its first trip on the 16th inst., when it went out with a crew of six people, including Lieut. Bois, of the Aeronautical Department of Chalais Meudon, who was in charge. She was started off in the direction of Bonnieres, and turned successfully in spite of a considerable wind. She circled round the village of Lavacourt at a speed of 15 miles an hour, then moved along the hills bordering the Seine and returned towards Moisson, stopped dead some 200 ft. above the shed, and settled down quietly having been 2 hours and 20 minutes in the air.

Aerial Warfare.

A lecture was delivered by Colonel Fullerton, R.E., at the Royal United Service Institution on Thursday evening of last week on the prospects of flying machines for military purposes.

"There was no doubt," said Colonel Fullerton, "that in the next great war flying machines would be regularly employed (1) against other airships, (2) against sea forces, and (3) against land forces. The object of each side would be in the first instance to obtain command of the air by purely aerial warfare, and for this they would maintain a high-speed flying machine armed with light guns. The aerial battles would practically settle the first period of the campaign.

"Against the enemies' navies flying machines would be chiefly used for reconnoitring, but probably efforts would be made by firing special projectiles, more or less vertically downwards on to the decks, to inflict actual injury on the vessels. Location and destruction of submarines would also be a special function of the airship, as from a position high in the air objects 30 or 40 ft. below the water can readily be detected.

"The use of aeroplanes against land forces would involve, of course, reconnoitring as a principal duty, but depôts might be set on fire, mounted troops attacked, and horses stampeded.

"At present it would appear desirable to construct machines weighing up to 1,000 lbs. for one passenger, with a speed of 30 miles an hour, and, say, about 25 h.p., for two passengers weighing up to 1,500 lbs., with horse-power up to 30, and a larger type weighing up to 10,000 lbs., and with horse-power from 250 to 300 capable of travelling at 40 miles an hour. It is these last that would be suitable for military reconnoitring work.

"At present it appeared doubtful whether the flying machine could be employed for commercial purposes."

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Command of the Air.

Colonel Wilfrid Ashley, M.P., chairman of the Parliamentary Air Committee, delivered an address on the "Command of the Air" to a meeting of the members of the 1900 Club on November 15th, presided over by Viscount Peel. Reviewing the development of British aviation during the past five years from the standpoint of national defence, Colonel Ashley paid a warm tribute to the achievements of the R.N.A.S. and the R.F.C. In urging the need for closer coordination between the Naval and Military branches of the air service, he said it was important for the vigorous prosecution of the war to secure unified control in all matters relating to design of machines, contracts, stores and the supply of material. He appealed for the full and unqualified support of the country for the Air Board under the presidency of Earl Curzon, and said that until large executive powers were conferred upon the Air Board by the Government, aircraft as an essential part of our war organisation could not achieve its highest point of efficiency. He expressed deep regret that difficulties had been placed in the way of a great unified air service by the Board of Admiralty, and he sincerely hoped that the Prime Minister and First Lord of the Admiralty would realise the importance of a full recognition of the functions of the Air Board by the Board of Admiralty at the earliest moment.

He said he was satisfied that the Air Board should include a representative of the Ministry of Munitions, and he added that in the view of the Parliamentary Air Committee it would be entirely to the advantage of the Royal Naval Air Service if an Air Lord were added to the Board of Admiralty.

PERSONALS

Casualties.

Second Lieutenant T. E. Barton, R. Irish Rifles, who was reported missing, is now officially reported killed. He was the youngest son of the late Charles W. Barton, and Mrs. Barton, of Glendalough House, Annamoe, Co. Wicklow, and was educated at Fettes and Cambridge University. He enlisted in the R.N.A.S. soon after the outbreak of war, and served in Gallipoli in the Armoured Car Section. In December, 1915, he obtained a commission in the R. Irish Rifles, and went to the front on May 15th. He was killed at the head of his men while leading a charge.

Second Lieutenant Charles E. MacRae, Seaforth Highlanders, attached R.F.C., killed, was the third son of the Rev. Donald MacRae, B.D., parish minister of Edderton, who is at present on service as a military chaplain, and has had three sons in the Army. At the outbreak of war he was in the Seaforths. About a year ago he was commissioned lieutenant, and some months ago transferred to the R.F.C.

Flight Sub-Lieutenant F. A. Rivers Malet, R.N. (accidentally killed in the great operations in the air last week), belonged to families whose members have been long associated with the service of the Crown, including Sir Edward Malet, formerly Ambassador at Berlin, and Admiral Sir Reginald Bacon, commander of the famous Dover patrol. His father is Lieutenant H. Rivers Malet, R.N., and his mother is a daughter of the late Major King, Royal Scots Greys. He was born in India, and educated in South Africa and King's School, Worcester. He entered the firm of Messrs. Green, ship engineers, and afterwards went to Cornwall for marine salvage work, and became a member of the Cornwall Fortress R.E. He went to British Columbia in 1913 for salvage work, and joined the Canadian Naval Forces, but on war breaking out he enlisted in the 48th Highlanders of Canada as a motor cyclist, and served in Lord Brooke's Brigade. Early this year he was transferred to the Navy owing to his knowledge of engines and motors, qualified as a pilot, and was sent to Dunkirk, where he had many successful fights and flights. Recently he dropped in the North Sea, and was rescued by a destroyer, and on another occasion he put to rout a big aeroplane which had greater speed and armament than his own. His brother is also a flight lieutenant. The funeral took place at Chatham with naval honours.

The death is announced of Second Lieutenant Lawrence Hill Wilson M'Kisack, 5th (Royal Irish) Lancers, attached R.F.C., who was killed at Thetford, Norfolk, on the 13th inst., as the result of an aeroplane accident. Deceased was the elder son of Dr. and Mrs. H. L. M'Kisack, 88, University Road, Belfast, and was 23 years of age.

Second Lieutenant Henry Joseph Newton, Cheshire Regiment, attached R.F.C., was reported missing on August 2nd, but news of his death on that date has now been received through the Red Cross at Geneva. The younger son of Mr. and Mrs. A. Newton, of 37, Netherhall Gardens, Hampstead, he was educated at University College School, where he was a monitor, a colour-sergeant in the O.T.C., and a member of the Bisley VIII. and of the first XV. He held the challenge cup for boxing from 1908 till 1914. In July, 1914, he matriculated at London University, and on the outbreak of war he immediately offered his services. After serving as sergeant in the 12th London Regiment, he was gazetted Second

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SOME PUPILS WHO HAVE RECENTLY SECURED THEIR CERTIFICATES AT THE RUFFY-BAUMANN SCHOOL.—1. Messrs. Tom West. 2. E. Hayes. 3. T. Williams. 4. J. Trubridge. 5. D. Barnes. 6. J. Holmes 7. E. S. W. Fanshawe. 8. G. Durand.

Lieutenant in that battalion in September, 1914, and went to the front on Christmas Day. In the following February he received his second star. He was wounded at Ypres in May, and soon after his convalescence resigned his commission and went to Sandhurst, where he became a sergeant. In November he was appointed a Second Lieutenant in the Cheshire Regiment, and was attached to the R.F.C., going to the front as an observer in May, 1916. He would have reached his 20th birthday on August 6th.

Second Lieutenant W. A. M. NIVEN, R.F.C., reported killed on October 28th, was the eldest son of Mr. A. Y. Niven, of Johannesburg, and grandson of the late Mr. A. M. Niven, of Glasgow. When war broke out he enlisted in the Transvaal Scottish, and went through the German South-West African campaign under General Botha. Early this year he came to England, and, obtaining a commission in the R.F.C., served at the front until he was killed.

Missing.

Lieutenant A. ANDERSON, Connaught Rangers and R.F.C., reported missing, is the only son of Professor Alexander Anderson, M.A., LL.D., a native of Camus, Coleraine, who has been President of the Queen's (now University) College, Galway, since 1899.

Lieutenant TREVOR MOURTRAY BENNET, M.C., Royal Irish Rifles, attached R.F.C., missing, believed killed, was the son of Mr. James Bennet, Belfast. He obtained his commission two years ago. Quite recently he joined the Flying Corps, and on the 10th inst. took part in a thrilling combat near the British lines.

Lieutenant JOHN H. LOWSON, R.F.C., previously reported missing during an aerial raid over the German lines, is now officially reported wounded and a prisoner at Osnabruck. He is a son of the late Mr. W. B. Lowson, a well-known Belfast stockbroker, who resided in Chichester Park Villas, Antrim Road, and of Mrs. Lowson, now of 7, Great Stuart Street, Edinburgh.

Married and to be Married.

A marriage is arranged, and will shortly take place, between EDMUND WILFRID SHARPE, Yeomanry, attached R.F.C., youngest son of Mr. Edmund Sharpe and Mrs. Sharpe, of Halton Hall, Lancaster, and ELEANOR ALICE ("NOREEN"), eldest daughter of Mr. W. H. PERSSE and Mrs. PERSSE, 44, Craven Avenue, Ealing.

ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatic, write to "FLIGHT" about it.

J. R. K. (Newcastle).

In machines in which the machine gun is fired "through" the propeller, the gun is fixed in relation to the machine, *i.e.*, it cannot be swivelled either in a horizontal or vertical direction. It is usually mounted just above the top of the *fuselage*, pointing straight forward. During a spurt it would obviously happen occasionally that one of the propeller blades was in line with the trajectory of the machine gun projectiles. As a matter of fact this happens less frequently than one would expect, the proportion of bullets which hit the air screw being only in the neighbourhood of 3 per cent. Still, those 3 per cent. would of course soon destroy the screw, and to guard against this a comparatively narrow band of armour plating is put on the propeller blade where it is in line with the gun, and the projectiles then strike this armour and are deflected without doing any damage. You are quite wrong in supposing that the lower surface of an aerofoil does most of the work, and we cannot imagine the author of a modern book on aerodynamics stating that this is so. As a matter of fact, wind tunnel experiments show that the upper surface of an aerofoil contributes about three-quarters of the total force normal to the chord. The small air screw you have noticed on several machines is probably driving the oil pump. On some German machines a similar air screw is used for generating the current for the wireless set, but this is a somewhat inefficient method, as the drive is less positive than a direct drive from the engine. The small tube facing forward, and which leads to the pilot's cockpit, is called a Pitot tube, and serves to indicate the air speed of the machine. Your last question is not quite clear, but we take it that your difficulty is, having found the resistance in lbs. at a certain speed, to find the resistance at any other speed. For practical purposes it is sufficiently accurate to assume that the resistance increases as the square of the speed. In other words, suppose that the resistance of an aeroplane is 300 lbs. at 60 m.p.h., and you wish to find what the resistance will be at, say, 100 m.p.h. Then, as the resistance is assumed to increase as the square of the speed, we have the proportion $300 : 60^2 = x : 100^2$, from which $x = \frac{300 \times 10{,}000}{3{,}600} = 833{\cdot}3$ lbs.

H. S. (Birmingham).

We do not know of any recent experiments with the man-driven aeroplane. Some years ago a competition was held in France, but neither of the competing machines succeeded, if our memory serves us right, in leaving the ground for more than a short hop, which would in all probability have been equally easily accomplished without any wings of any sort on the machine. We do not think that there is any hope whatever of realising man-driven flight on the principles on which the aeroplane, as we know it, is built.

4084 (R.F.C.).

The letters B.E. originally stood for Blériot Experimental, and indicated a type in which the screw was placed in front and the tail carried on a *fuselage*. People with a facetious turn of mind have been known to assert that B.E. meant bits of everything, but this is not confirmed. F.E. originally meant Farman Experimental, and were the class letters, so to speak, of the "pusher" type. They are now generally taken to mean Fighting Experimental. R.E. has, as far as we know, always stood for Reconnoitring Experimental.

T. S. (Bournemouth).

It is not usual to glue the ribs on to the spars, but merely to fasten them with screws. Sometimes a little glue is used for assisting the screws in securing the ribs to leading and trailing edges. In some machines the wiring plates and eye bolts are put on the outside of the fabric, as in the B.E. and Avro, while in others the fabric is put on top of the fitting, which has only the strut socket and flange of the wiring plate projecting through the fabric. This latter method is, we believe, employed on the Sopwith machines. The covering is usually done by sewing together strips of the fabric until this is large enough to cover both sides of the wing, and is then tacked to the trailing edge, taken across the wing round the leading edge and back to the trailing edge, where it is stitched. The fabric should be pulled tight from the ends of the wing in order to get it to follow the curve of the ribs. Frequently the fabric is attached to the ribs by stitches of No. 1 kite cord around the rib with about 3 ins. pitch. An upholsterer's needle will be found to be handy for this purpose. When the stitching is complete the stitches are covered up with 1 in. white seaming tape, solutioned on. So far as we know, there are no books dealing with subjects such as these, which can really only be picked up by practical experience.

R. L. A. (Chorley).

We regret that neither time nor space will allow us to answer your first question, as this would entail getting out three different complete designs, at least complete as regards general arrangement, which would entail days, possibly weeks, of work. The petrol consumption of an aero engine may be taken roughly as 0·075 gallon per b.h.p. hour.

A. L. H. (Colwyn Bay).

The only machine to complete the full course at Chicago in 1912 for the Gordon-Bennett Aviation Trophy was the Deperdussin piloted by Jules Vedrines. His time for the 200 kiloms. was 1 hr. 10 mins. 56 secs. The rotary engine fitted to some of the Fokkers is the Oberursel, a German copy of the Gnome.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

Cairo, November 13th.

"In revenge for the raid which was carried out by 12 of our aeroplanes at Beersheba and Maghdaba on Saturday last, when they seriously damaged some military establishments, which, naturally, were the sole objects of attack, one hostile machine this morning dropped nine bombs on the business and residential quarters of Cairo. The enemy thus adheres to the principle of directing attacks, not on military targets, as prescribed by international law, but on dwellings and on the persons of the inoffensive civil population."

War Office, November 14th.

"*Egypt.*—Yesterday an enemy aeroplane flying very high dropped several bombs in and about Cairo, killing and wounding a number of civilians. No military damage was done, and only one military casualty was incurred."

[It was announced in Cairo that 14 persons, including four Europeans, were killed, and 25, including four Europeans, were injured.]

War Office, November 15th.

"*Egypt.*—A further air attack was undertaken to Maghaba during the night of the 14th. The enemy was completely taken by surprise, and our machines, descending to a very low altitude, dropped 400 lb. of explosives on the camp and storehouses, causing considerable damage. Our machines have returned safely."

General Headquarters, November 15th, 10.3 p.m.

"Yesterday our aeroplanes did much useful work. Last night they made successful bombing attacks on an enemy aerodrome and railway lines, stations, and rolling-stock."

Admiralty, November 15th.

"During the early hours of this morning the harbours and submarine shelters at Zeebrugge and Ostend were again heavily bombarded by squadrons of naval aeroplanes and seaplanes. Direct hits were observed in the Atelier de la Marine and in close proximity to the power station. A large fire, probably emanating from a petrol store, was also observed. All machines returned safely."

War Office, November 16th.

"*Egypt.*—The General Officer Commanding-in-Chief, Egypt, reports that aircraft successfully bombed Maghara, Auja, and Kossaima on the 15th. All the machines returned in safety."

General Headquarters, November 16th, 9.25 p.m.

"Yesterday our aeroplanes carried out several successful bombing raids. One hostile machine was driven down damaged."

Admiralty, November 17th.

"A successful raid was made on Ostend and Zeebrugge this morning (17th inst.) by British naval aeroplanes and seaplanes. A considerable weight of bombs was dropped with good results on the docks and shipping. All machines returned safely.

"With reference to the raid reported in the French *communiqué* on October 25th, when 11 British naval aeroplanes, accompanied by five French machines, bombed the Essingen Works at Hagendingem, a fuller report has now been received, from which is appears that considerable damage was done. The objective consisted of blast furnaces and steel works, and was therefore of especial interest from a naval point of view, as the steel which is produced there is used in the construction of big guns. According to the reports of the pilots, only two factory chimneys were left intact after the last bombs had been dropped, and therefore, although it is possible that part of this factory may be in working order again shortly, the greater part of the works attacked will be out of action for some considerable time."

General Headquarters, November 17th, 9.16 p.m.

"Yesterday much successful work was accomplished by our aeroplanes. Two important junctions on the enemy's lines of communication were bombed, and railways, billets, and aerodromes were attacked with bombs and machine-gun fire both by night and day. The enemy aircraft showed more enterprise than usual, with the result that three of his machines were brought down on our side of the line and two on his side, and at least five more were driven to the ground in a damaged condition. Three of our machines are missing."

War Office, November 18th.

"*Mesopotamia, Euphrates Line.*—On the 13th inst. British aeroplanes again attacked a hostile gathering near Al Ain, nine bombs exploding in the enemy's camp.

"*Tigris Front.*—On the 12th inst. an enemy aerodrome in the neighbourhood of Kut-el-Amara was bombarded, 16 bombs being dropped with good effect.

"*Egypt, Saturday.*—The General Officer Commanding-in-Chief, Egypt, reports :—

"A surprise attack by aircraft was made on the enemy camp at Masad (five miles west of Arish) on the morning of the 17th ; 800 lb. of explosive were accurately dropped on the tents with great effect. Our machines have all returned.

"*Salonica.*—Our airmen successfully bombed the enemy's camp north-east of Seres."

General Headquarters, November 18th, 10.50 p.m.

"Yesterday there was much fighting in the air. In one protracted combat between five of our machines and eight of the enemy's, one hostile machine was destroyed and the rest dispersed. In other encounters seven hostile machines were driven down damaged. Three of our machines are missing."

Admiralty, November 20th.

"On November 18th British seaplanes and aeroplanes, operating against the Bulgarian coast, successfully bombarded Karjani, Pravishta, and Senultos."

French.

Paris, November 16th.

"Yesterday one of our pilots brought down an enemy machine near Chaulnes."

Paris, November 17th.

"Our guns forced two aeroplanes to come down in our lines, one the day before yesterday, south of Atteichy, and the other yesterday, near Roye-en-Matz. The aviators were taken prisoners.

"Yesterday our aircraft in the region of Amiens fought 54 fights, in the course of which Lieut. Heurteaux brought down his 13th machine, and 2nd Lieut. Guynemer his 21st.

"During the night several bombardments were carried out, notably against the railway station and works of Esch-sur-Alzette (Luxemburg) and the aviation park of Tergnier. Over 1,500 kilogrammes (1½ ton) of bombs were dropped.

"Flight Capt. de Beauchamps ascended at 8 o'clock this morning for a flight to Munich. Arriving about noon over that town, he dropped several bombs on the station as a reprisal for the bombardments of the open town of Amiens, carried out by the Germans within the last few days. He afterwards landed at Santa Dona di Piave (in Italy, 12½ miles north of Venice), after crossing the Alps. He thus covered a distance of 700 kilometres (437½ miles)."

Paris, November 18th.

"On the 16th inst. one of our machines, carrying Sub-Lieut. Pilot Loste and Quartermaster Machine-gunner Vitalis, brought down, on the Somme front, a German aeroplane. This is the fifth machine brought down so far by these two airmen.

"On the 17th two German aeroplanes were brought down by our pilots. One of these fell in flames near Hallui ; the other was destroyed by Adjutant Tarascon, who thus gained his eighth victory, and fell near Manancourt (Somme region). Two other German machines were brought down in aerial duels north of Fouquescourt, south-west of Vouzières, after a lively engagement. One of our pilots used his machine-gun at very close quarters upon a German machine, one of whose wings became detached, and the machine crashed to earth in the region of Marvaux. Finally, a sixth enemy aeroplane, attacked by one of ours, fell in flames in the region of Vieville-en-Have.

"Last night one of our air squadrons dropped 157 bombs on the enemy aerodromes at Golancourt (Oise) and Grisolles (Aisne).

"Twenty-two British naval aeroplanes at daybreak yesterday bombarded the electric power-stations and the naval workshops at Ostend. They dropped 180 bombs, many of which reached their objectives. Another bombardment was carried out by hydroplanes against the Zeebrugge jetty. All the machines returned safely.

"*Salonica.*—British airmen bombarded enemy camps near Seres, while ours dropped bombs on bivouacs and camps at Novak and Monastir."

Paris, November 19th.

"It is confirmed that on November 16th Warrant Officer Dore brought down his sixteenth German aeroplane. The German machine fell near Marche le Pot (Somme)."

Belgian. *Havre, November 18th.*

"Our air squadrons carried out night bombardments of the enemy works at Lokeren and on the aerodrome at Ghistelles."

Italian. *Rome, November 14th.*

"Hostile aircraft attempted to make raids over our territory with great persistence, but were driven off by the fire of our anti-aircraft batteries and aeroplane attacks. In the Upper Vanoi valley an enemy squadron succeeded in dropping bombs on Canale San Bovo, killing two soldiers and some animals.

"On the evening of the 12th enemy seaplanes dropped bombs on Ravenna, Pontelagoscuro, Polesella, Magnavacca, Ariano, and Polesine. There were no casualties or damage. Air raids on Romans, Vermegliano, and Doberdo yesterday were equally fruitless. An enemy aeroplane attempted to attack one of our observation balloons, but was hit by our artillery, and fell in over the enemy's lines near Nabresina."

Rome, November 15th.

"During the night of November 14th–15th enemy seaplanes dropped bombs round Aquileia, killing two soldiers and wounding four women and children. After this Italian aircraft promptly attacked the floating hangars of the aggressors at Prosecco and on the pier at Trieste, both of which were bombarded with marked success. Enemy aeroplanes were active in the Gorizia area, but no damage was done by their bombs."

Rome, Novembrr 16th.

"On the Carnia front enemy aircraft dropped bombs on Stazione Carnia without causing harm, and on Moggio Udinese, killing two women and wounding three.

"Enemy aeroplanes dropped bombs in the Vallone (Carso) without doing damage."

German. *Berlin, November 14th.*

"During the month of October our flying corps, with great success, has splendidly carried out its heavy and manifold duties on the Western front. Special recognition and thanks are due to the airmen engaged in artillery and infantry observation. Their effective protection was assured by the battle airmen, who also splendidly carried out their special tasks, and by the fire from our anti-aircraft guns.

"We lost 17 aeroplanes, while our enemies in the West, the East, and in the Balkans lost 104 aeroplanes. Of these 83 were lost in aerial fights, 15 by being hit by anti-aircraft guns, and six by forced landings behind our lines. Sixty enemy aeroplanes are in our possession. On the other side of the line 44 can be seen which have fallen to earth."

SIDE-WINDS.

"IT'S a way they have in the Navy," as the old song says, and the R.N.A.S. is imbued with the same spirit, whether at work or play, as the recent concert at Lime Grove Hall bears witness. Organised by the ratings at the White City and Wormwood Scrubbs Depôts, a sum of no less than £186 4*s*. 9*d*. was raised, £100 going to the Flying Services Fund, administered by the Royal Aero Club, and the remainder to the Trafalgar Orphan Fund. C. P. O Bullimore was the leader in the organising, and the result is eloquent testimony not only to his own labours but also to the enthusiasm with which he inspired his band of helpers, while splendid assistance was given by the ladies from the Administration offices in the selling of programmes. The full band of the R.N.D. was in attendance, and was much appreciated.

C.P.O. Bullimore, who put in such good work organising the R.N.A.S. concert which raised £100 for the Flying Services Fund.

* * *

SINCE acquiring their new premises at 179, High Road, Kilburn, the Central Aircraft Co., which is the aviation branch of the old-established firm of R. Cattle, Wybert Street, Stanhope Street, N.W., have gone ahead in remarkable style. Although it is only a matter of weeks since the place, then a builder's yard, was taken over, work is in full swing in the various shops, and the constant humming of the many spindles and the buzzing of the saws witness in most convincing fashion to the amount of work in hand. All the shops are light and airy, and a steam boiler, which was used by the previous occupiers for power generation, now provides the steam necessary to heat all the various departments. A doping shop is nearing completion, and excellent results are confidently expected from the new scheme of ventilation which is being employed. Visitors to the works cannot but be impressed by the very fine workmanship of the woodwork turned out by the Central Aircraft Co., a fact which is evidently becoming more and more widely known among British aircraft constructors, judging by the orders on hand. What particularly impressed us on a recent occasion was the high quality of the spindling; such parts as I-section wing spars being so neatly spindled that the wood was absolutely smooth at both ends of the spindled portions and not torn up and left ragged where the cutters had gone against the grain. Again in the matter of struts, it was noticed that practically all the shaping was done by machinery, leaving practically nothing to be finished off by hand. The advantage of this is obvious, since, once the cutters are right, all struts will be identical, which cannot be the case where a great portion is worked up by hand. Mr. A. Cattle, ably assisted by his works manager, Mr. C. Borthwick, are to be congratulated, not only on the extension of the business, but on the quality of the work turned out, and manufacturers with sub-contracts to place for wood parts such as wings, skids, struts, or spars, should get into communication with the Central Aircraft Co.

* * *

SOME very interesting possibilities are on the boards—drawing boards—at the Wells Aviation Co., Chelsea, a firm which, under the direction of men of enterprise and broad vision, long ago left behind its small, very small, beginning and is rapidly mounting to a place of considerable importance in the industry. With a firm belief in the future of aviation those in charge of the company's destinies are determined to keep going ahead, and they will be well worth watching. Already they have built up an enviable reputation for workmanship, and as the designing department includes several men with ideas, some business on original lines may be looked for.

* * *

THE gallantry of Mr. M. G. Smiles in his plucky attempt to rescue the boy who was unfortunately drowned in the Silk stream at Hendon on September 6th is not to be forgotten, the Royal Humane Society having awarded their honorary testimonial inscribed on vellum.

* * *

FOLLOWING on the marriage of Mr. Sydney Pickles and Miss A. R. E. Marks, as reported in last week's "FLIGHT, comes a letter from Devonshire where the pair are spending their honeymoon. It is to be hoped that the weather in that sunny county is something better than that which we are experiencing here at the present moment. By the way, what a lot of converts that fabulous deity Hymen is discovering amongst aviators these days.

* * *

IT came as a surprise, the news that Marcus D. Manton had left the Grahame-White company after so many years at Hendon, and had joined up with J. Samuel White and Co., of Cowes, as test pilot for the machines of their manufacture. His many old friends will miss his cheery personality, but one and all will wish him success in his new position. Testing machines must be far more interesting than instructing pupils in the art of flying, though there certainly must be many scores of pilots now on active service who owe their skill to the patient and painstaking tuition of their former instructor.

COMPANY MATTERS.

A. Darracq and Co. (1905), Ltd.

The directors, in submitting to the shareholders the balance-sheet and profit and loss account at September 30th, state that the accounts show a net profit for the year of £90,538 12s. 3*d.* after writing off depreciation of buildings and other charges shown in the profit and loss account. This net profit, added to the sum of £12,472 19s. 5*d.* brought forward from last year, gives a total to the credit of profit and loss account of £103,011 11s. 8*d.*

After payment of £15,000 to the debenture service fund and the half-year's dividend at the rate of 7 per cent. per annum on the preferred ordinary shares, distributed on April 1st, 1916, amounting to £13,125, there remains a balance to the credit of profit and loss account of £74,886 11s. 8*d.*

The directors have transferred £20,000 to reserve account (making the same up to £170,000), and after providing for the dividend on the preferred ordinary shares, paid October 2nd, 1916, which amounted to £13,125, they now propose to declare a dividend at the rate of 9½ per cent. on the ordinary shares, which will absorb £26,125, and to carry forward the sum of £15,636 11s. 8*d.* to next year's account.

The goodwill account (which originally stood at £416,123 7s. 2*d.*) has now been eliminated from the balance-sheet.

The outstanding debenture bonds (which originally stood at £150,000) amounted at September 30th, 1916, to £49,800, and these have now been repaid at par.

In accordance with the proposal communicated to the shareholders, and approved by them at the last annual general meeting, the transfer to a French company of French assets (land and buildings being made the subject of lease) has been completed.

As a logical sequence to this transaction, a similar transfer of the Fulham and Bond Street assets has been made to an English company formed to acquire them.

The position of this company has therefore become that of a company holding share interests in the capital of these companies, which are respectively named Société Anonyme Darracq and Darracq Motor Engineering Co., Ltd.

The main sources of revenue of this company are the dividends declared by the companies named. In the case of the Société Anonyme Darracq, an interim dividend amounting to 20 per cent. was paid in April, 1916, but the accounts for the full year's trading of that company have not yet been completed. In the case of the Darracq Motor Engineering Co., Ltd., a dividend at the rate of 6 per cent. has been received.

The directors have deemed it prudent to transfer from the balance otherwise available for distribution the sum of £20,000 to reserve, and shareholders will notice with satisfaction that, in addition to the extinction of the debenture and goodwill items in the account, their holdings are protected by the possession of a general reserve of £170,000.

The Sunbeam Motor Car Co., Ltd.

The directors, in advising the shareholders at the annual general meeting on November 28th, state that as the amounts payable to the Government for excess profits duty and under the Munitions of War Act have not yet been ascertained, they will be quite unable to present a balance-sheet which could be certified as correct. As soon as the figures have been ascertained the usual statement of accounts will be forwarded to members.

The directors, however, state that the volume of business done during the year has been greater than in any previous year of the company's history, and they are satisfied that the retainable profits allow them to recommend the following appropriations:—(1) To confirm dividend on preference shares paid April 15th, 1916, £900; (2) to confirm interim dividend paid on ordinary shares April 15th, 1916 (free of tax), £12,000; (3) to pay the balance of dividend on preference shares, £900; (4) to pay a dividend of 10 per cent. (free of tax) upon the ordinary shares, making with the dividend already paid 15 per cent. for the year, £24,000; (5) to pay a bonus of 3s. per share upon the ordinary shares (free of tax), £36,000; (6) to place to the staff bonus fund, £5,000.

PUBLICATION RECEIVED.

Fascicule Relatif a une Nouvelle Détermination des Valeurs des Puissances Dans les Essais d'Helices.

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

Straights with instructor last week: Messrs. Balden, Coltman, Fielding and Nightingale. Circuits with instructor: Messrs. Flynn, Pearman, Kaizer, Munro, Sutherland and Travers. Circuits alone: Messrs. Hitchcock, Lord, Ransom, Rogers, Norris and Steeves.

Bournemouth School.

Pupil with instructor last week: Mr. Ross. Pupils rolling alone: Messrs. Vermorel and Fisher. Straights alone: Messrs. Ross, Hall and Peat. Half circuits alone: Mr. Allen. Figures of eights or circuits alone: Messrs. Burry and Holland. Instructors: Messrs. E. Brynildsen and H. Smith.

Several passengers were carried during the week by Mr. Brynildsen.

35, 45 and 60 h.p. Caudrons in use.

NEW COMPANIES REGISTERED.

AIR NAVIGATION CO., LTD.—Capital £240,000, in £1 shares, acquiring the business carried on by Louis Blériot at Brooklands, Weybridge, Surrey, as L. Blériot Aeronautics. First directors: L. Blériot, N. A. Chereau (managing director) and R. Todd.

HAMPSHIRE AIRCRAFT CO., LTD.—Capital £100, in £1 shares. Directors: F. J. Privett and Mrs. N. M. Privett, both of Southsea.

Aeronautical Patents Published.

Applied for in 1915.

Published November 9th, 1916.

14,694. G. Caproni. Flying machines.
15,866. E., H. L. and H. O. Short. Safety belts.

Published November 16th, 1916.

13,933. W. F. Luff and A. W. Turner. Aircraft.
15,085. T. Sloper. Hydro-aeroplanes.
15,135. E. Lazarte. Anti-aircraft guns, and mountings therefor.
15,746. O. Schüle. Maintaining lateral balance of flying machines.

Published November 23rd, 1916.

15,290. A. A. Holle, Judge and Varioplane Co. Planes.
15,504. C. A. Wragg. Planes of aeroplanes, airships, &c.

Applied for in 1916.

The numbers in brackets are those under which the specifications are printed and abridged, &c.

Published November 9th, 1916.

257. A. Glissenti. Improving output of power from screw propellers. (101,806.)
5,349. Blackburn Aeroplane and Motor Co. and R. Blackburn. Safety belts for aviators. (101,833.)

Published November 16th, 1916.

6,062. A. V. Roe. Aviators' belts, &c. (101,765.)

Published November 23rd, 1916.

6,165. D. C. M. Hume. Model aeroplanes. (101,927.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week.

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EDITORIAL COMMENT.

The Air Board and the Admiralty.

IN conformity with the promise of the Prime Minister, a day is to be given shortly—either during the present or next week—for the discussion in Parliament of matters affecting the Air Services, and in particular the relations between the Air Board and the Admiralty. In the meantime "Our Political Correspondent" has been busy in the dailies with the pros and cons of the question, without, it must be said, shedding much in the way of new light on a vexed situation. The principal thing that emerges is that there undoubtedly exists a very strong feeling that in Mr. Balfour we do not possess the ideal First Lord, and that the sooner a change is made in favour of a younger and more virile statesman, the better it will be for the administration of the Admiralty and for our chances of early victory in the war.

Without going into the question of the merits of the present First Lord in relation to his administration of the Admiralty as a whole, it certainly does seem to us that his attitude in regard to the Air Service leaves a great deal to be desired. And as we conceive supremacy in the air to be a vital consideration, there does not appear to be any necessity to go beyond this part of the whole question in order to be able to arrive at a decision. If it can be shown that under Mr. Balfour's administration we have allowed any single branch of the Naval service to fall short of a state of the highest efficiency, then it is time a change was made, and that instantly.

Let us regard the present situation, so far as it is known in the light of what has been allowed to transpire. According to the *Daily Mail's* Parliamentary correspondent, matters as between the Air Board and the Admiralty have reached a condition of absolute deadlock. As the correspondent says, the Air Board was formed to overcome jealousies between the two Services which threatened the efficiency of both. One of its chief duties was understood to be the decision of the number of new machines to be delivered to each, having regard to the relative urgency of their requirements. The Admiralty flatly declined to accept the Board's decisions, and claimed the right to order machines and material irrespective of any orders the Board might give. As a result of the friction that inevitably arose as a consequence, the Air Board demanded from the War Council full powers to enforce its decisions. That was over eight weeks ago. The War Council sent on the report of the Board to Mr. Balfour for comment, and it is understood that his reply was a practically direct refusal to agree to the demands of the Board. Assuming that this is correct, obviously the War Council is faced with the problem of deciding between Mr. Balfour and the Air Board. Apparently, since the matter is at least eight weeks old, the policy pursued has once again been that of "Wait and See." And, despite the fact that we are at war, that policy looks like being persisted in for at least another week at a time when days, even hours, are of untold value.

What is at the back of the Admiralty attitude? Is it Mr. Balfour who is primarily to blame, and if not, who is the stumbling block? Of course, whoever or whatever is at fault, it is the First Lord who must shoulder the responsibility for the lapses of his own department. If he himself is at fault then he must give place to someone else with a wider outlook and greater virility in administration. If it is in fact his advisers who are at fault, the responsibility is equally his by reason of the fact that he has chosen them wrongly and continued them in their posts after they have been found wanting. Naturally, we do not expect the First Lord to come down to the House and admit that his administration has been wanting in the necessary ability, but by this time he should certainly have realised that the country is profoundly dissatisfied and insists on change or satisfactory explanation. One or other of these eventualities is bound to come about, and of the two we prefer the former. Matters have gone too far and Parliament and the country have been treated with too cynical a contempt to allow of explanation being an entirely satisfactory solution of the question.

For our own part, we are inclined to the opinion that the Admiralty attitude of impossibility towards the Air Board lies not so much at the door of the First Lord as at that of his advisers. In matters of technical administration such as are involved in the present case, a civilian First Lord, even though he be a distinguished philosopher and a brilliant musician, is, and must be, almost entirely in the hands of those whom he has appointed to advise him. Unless matters of high politics are involved he must accept their opinions at their face value. When he ceases to do that they must either resign or, alternatively, receive their dismissal at his hands. It may be unfortunate for him or for them, as the case may be, but that is the position when it is brought down to bed-rock.

It is very little more than a year ago that the R.N.A.S. was "reorganised." Ostensibly it was necessary, the Service having grown to dimensions, since the outbreak of the war, that rendered reorganisation essential. There has been a great deal of talk about this reorganisation, and it has been said that the lines along which it has been effected have been mainly in the direction of "navalising" the Air Service, rather than to mould it into a more or less elastic service fit for the purposes of war. In a word, it is openly talked of that the reorganisation has taken the shape of a rigorous insistence on the forms and routine of the Royal Navy more than that of the creation of an effective fighting service which, in the nature of things, cannot be brought absolutely into line with Naval customs and traditions in the time available, except at the cost of a serious loss in efficiency. Not to put too fine a point upon it, the reorganisation has not been the success it was expected to be, and for the reasons thus briefly set forth. Let it be understood that there is no reflection whatever implied in this on the R.N.A.S. The fault, if fault there be, is at the top. It is a distasteful task to criticise those who have no opportunity of reply, but we are at war, and in such a time as this it is the country and not the individual that is to be considered. Therefore, it is pertinent and proper to ask if those who were entrusted with the reorganisation of the R.N.A.S. and who are to-day the responsible advisers in matters relating to the Air Service of the First Lord are the best men to be found for their posts. That is a matter which we trust will not escape the attention of the Parliamentary Air Committee when the promised debate takes place. Mr. Balfour's administration is being attacked on many more grounds than those of the Admiralty-Air Board controversy, and it will be surprising if the outcome does not result in a change at the head of the Admiralty. It is clear that the country has lost confidence in him—and this is no time for the politician of any degree of party to cling to office for its own sake, however distinguished his record of the past. But it is of little avail to get rid of one administrative head if another is to be appointed to be trammelled by the same considerations as his predecessor. We have not the slightest desire to prejudge the case. All we say is that we believe there is a *prima facie* case for enquiry into the whole of the facts as they affect the attitude of the Admiralty towards the Air Board and that if such an enquiry discloses that another "reorganisation" of the R.N.A.S. is necessary, then let it be reorganised, no matter whose feelings may be harrowed in the process.

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"Prepare for 1917."

Day by day the despatches from the Western front indicate that the enemy is making gigantic efforts to regain at least a measure of his lost supremacy in the air. So far, his efforts have been attended by a conspicuous want of success, even when he has been able to mass a local superiority of force in his favour. We have the fullest confidence that, thanks to the magnificent skill and valour of our R.F.C. pilots, the issue of the struggle in the air will never be in the least degree doubtful if we at home do our part in seeing that they have the best machines in sufficient numbers. It is not particularly comforting either to those at the front or to those who perforce remain at home to realise that while the Germans are putting their foremost efforts into regaining the mastery of the air, our own Government procrastinates day after day and week after week while a sort of faction fight goes on among those who should be straining every nerve to maintain that which has been so hardly won. Let Parliament, let the country insist that there shall be an end at once of the pitiful spectacle of inter-departmental jealousies holding up progress that is vital to our national cause. Let us have done with all this bickering. Let us ruthlessly sacrifice, if need be, all who stand in the way and bend our energies to that preparation for 1917 upon which we have continued to insist these many weeks past.

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Insurance Against Aircraft Raids.

According to replies to questions given by the Prime Minister in the Commons, and Lord Hylton in the Upper House, the Government are considering "whether any alteration is necessary in their policy as regards injuries and loss of life in this country due to enemy operations." Lord Hylton averred that there were so many difficult and complicated points connected with the matter that it was impossible to say anything about it for the present. To our way of thinking, these difficulties are mostly imaginary. We have never departed from the opinions we expressed in 1914–15 during the period of discussion of compensation for material loss through

ON THE FRINGE OF A DESERT.—Air patrol work for the trade routes by our flying forces. *From an original drawing by J. Prochazka.*

air raids and other enemy operations—that these losses ought properly to be a national liability. As a business alternative if the Government could not see its way to the acceptance of this principle, we took the lead in advocating that anti-aircraft insurance should be made a national asset. This was eventually done some nine months later, as all the world knows.

The matter of compensation for loss of life or limb is on all fours with that of compensation for material loss, save that it appears to be infinitely simpler, while the liability of the community would be relatively infinitesimal. Supposing adequate compensation had been paid to all the victims of air-raids or bombardment since the beginning of the war, what would it have amounted to? Even calculated on a fairly generous scale, the amount of money involved would have been a mere drop in the ocean of expenditure—it would have hurt none and benefited many. Where the difficulties lie we confess we do not see. The Government already has the machinery in working for administering the material-insurance part of the scheme—though from what we hear that machinery is not conspicuous for smoothness of working—and it would surely not entail a great deal of complication to hand over to the department the assessment and payment of claims for loss of life or injury.

If it is not possible—though we fail to see any reason why it should be—to make this matter one of national liability, then let it become an extension of the existing scheme of insurance and be made into a national asset. We much prefer the former, but the main thing is that something must be done about it. Clearly, it is the business of the Government to do that something and the sooner the better.

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"No Afternoon Tea."

Mr. Burton Chadwick, the Director of Munitions Overseas Transport, writes to the Press advocating the abandonment of the afternoon tea habit. He says that it is obvious we are faced with a serious food shortage in the near future. The Government is taking steps to relieve the situation, but the possibility of treating the disease at the root does not seem to be seriously contemplated. He believes that before we are many months older our eyes will have been opened to the necessity of rationing essentials and more rigidly excluding the import of non-essentials if only to obtain abundance of war material.

Not only is the food supply of the country in danger in the future, but more important than this is the supply of food for the guns. To-day—we are still quoting Mr. Chadwick—our ships are being used largely for carrying grain, meat and foodstuffs to this country, to satisfy consumption on a peace basis, or perhaps it should be said on a war basis, which experience has shown to be even more extravagant. In the meantime we cannot get ships to carry our war material, and we are leaving behind on the quays of foreign countries tens of thousands of tons of material which is most urgently needed for the manufacture of munitions of war—shell steel, explosives, aircraft materials—in order that the people of this country may feed extravagantly!

Mr. Chadwick's remedy for the state of things he calls attention to is the cutting out of our afternoon tea. He would make it the law that no food should be allowed to be served in restaurants or hotels between the hours of 3 and 6 p.m. This, he thinks, would achieve these results :—

(1) The reduction in consumption of wheat, sugar, milk, eggs, butter, and margarine, to name only a few of the staple foodstuffs, would be enormous. (2) There would be a proportionately large saving in ships, railways, labour, coal and money. (3) Afternoon tea is a habit of the more well-to-do classes. Its stoppage would not hit the poor or the children. In fact, they would benefit by the resulting increase in food supplies and reduction in prices. (4) It would help to bring the war home to the people of this country, and until we realise—every man and woman of us—that every effort of which we are capable in brain, muscle, money, and self-sacrifice is going to be demanded of us down to our last man and our last shilling, we have not begun to see the victory we so comfortably prophesy.

We are not so sure but that he is right. Undoubtedly, there is worse to come than we have known hitherto, and bad as the worst may be it is nothing to the results that would accrue from losing the war. At all costs—and when we say at all costs we mean all that the phrase can denote—the war has got to be won. To win it we need food for the guns more than we need food for the stomachs of the people. If either are to be pinched it must be the last. To legislate against the "afternoon tea" habit would possibly cause untold misery to the flapper and the nut—we can imagine the howl that would rend the heavens at the very suggestion, seriously made—but we cannot see that any real hardship would be caused to anyone. If such legislation is not really necessary, then we are all against the sort of "control" we have become familiar with in the last two years. If, on the other hand, it is going to assist in shortening the war by a week, let the Food Dictator take hold of the matter at once—as soon as the Government can make up their minds to reconcile conflicting claims and let us know who is to control the nation's food. As to the necessity or otherwise of such control, we have an open mind, but it must be conceded that Mr. Chadwick has made out a very good case for examination and enquiry.

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Two More!

Another airship raid on England and two more enemy craft destroyed! Excellent news indeed! By this time the gentle Hun must be thinking furiously about the policy of risking his Zeppelins in abortive raids on this country, and be rapidly getting forced to the conclusion that the game is really not worth the candle. These craft cannot be replaced in a week as can aeroplanes, and, apart from the serious loss of material, there is the consideration that every Zeppelin brought down involves the loss by death or capture of at least twenty highly trained officers and men, whose replacement is an even more serious problem than that of the airship itself.

The loss of the airships themselves is a sufficiently serious matter for the enemy. So far as it is possible to gauge the building power of the Germans, it is open to belief that the losses sustained in the last four or five raids on England alone—to say nothing of other losses which have been reported—exceed the possibilities of replacement in the time. If that is so, then we have every reason to congratulate ourselves on that ground alone. Over and above this, however, there is the moral lesson that has been administered in the demonstration to the enemy that the days when he could raid our shores in practical immunity from serious attack have gone for ever. So vastly have our defences been improved that it has been shown that enemy airships cannot cross our coast line without almost the absolute certainty of loss. That is the best feature of all, and the one that will do more than anything to put a period to these murderous raids which have no apparent result other than the killing and maiming of civilians.

* * *

The R.N.A.S. and the Channel Raid.

We trust that the state of things disclosed in a question put on Monday to the First Lord of the Admiralty by Mr. Pemberton Billing, strengthened by a letter to *The Times* from Mr. Joynson Hicks, will not be allowed to stand where it is. Mr. Billing's question was :—

"Has the right hon. gentleman's attention been called to the fact that although we have many naval air squadrons, up to quite recently they have been absolutely and definitely forbidden to drop bombs on Zeebrugge, and that it is only by repeated representations by the wing commanders that they have been eventually allowed to do so ?"

No answer was given, the Speaker ruling that the question was not in order.

Mr. Joynson Hicks, in his letter, makes these very pertinent remarks :—

We have the finest depôt of the Service at Dunkirk, within 30 miles of Zeebrugge, and yet, for two months prior to the raid of the German destroyers in the Channel, no offensive operations took place. What do we keep that Service for at Dunkirk ? When we know that 10 German destroyers lay in Zeebrugge for two days and nights waiting the opportunity to raid the Channel, why was it that the Naval Air Service were not dispatched, day by day and hour by hour, at whatever risk to themselves, to destroy this nest of hornets ? It is known who was responsible for this neglect ; why was he not relieved or recalled ?

We are by no means inclined to prejudge the case. For all we are allowed to know there may have been sound reasons of strategy behind the alleged inactivity of the R.N.A.S. at Dunkirk. On the face of it, the R.N.A.S. station at Dunkirk has for its *raison d'être* the defence of these shores. That defence is best carried out by attacking the enemy in his lair, where the attendant risk to the attackers can be justified by the possible results of the enterprise, as in this case they obviously were. We say obviously, because since the Channel raid Zeebrugge has been successfully bombarded by our Naval aeroplanes. Manifestly, if this was possible *after* the raid, it was equally possible *before*. As we have said, it is quite on the cards that there were good reasons for the inaction, though they do not appear at the moment, and if they did in fact exist, then the country ought to be told. It may not be possible to state them in detail, but we must be assured that they did in fact exist—if they did. As a matter of fact we have cause to believe that there *were* reasons which were at the time good and sufficient and that these reasons do not now exist. In justice to the R.N.A.S. some authoritative statement ought to be made at once.

Does it after all resolve itself into material interests being at stake ? If so, there should not be a moment's hesitation in scrapping them, as after all, whatever material damage to Zeebrugge itself may eventuate, it can be but as a grain of sand to the contra side of the account which continuous bombing would bring about.

The burial in Germany of Flieger Leut. Mulzer, who had been awarded the Order "Pour le Merite" and who was killed in France.—A curious custom prevails in Germany of placing the coffin with the body of dead airmen on a plinth between four stone pillars on which are placed burning torches. This rite is called "Trauerfeier."

The British Air Services

"PER ARDUA AD ASTRA"

Under *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, November 22nd.

Temp. Sub-Lieuts., R.N.V.R.: A. Howard and J. S. Hughes entered as Prob. Flight Officers for temp. service and appointed to the "President," additional, for R.N.A.S., to date Nov. 26th; temp. commissions as Sub-Lieuts., R.N.V.R., terminated

M. H. Findlay entered as Prob. Flight Officer for temp. service and appointed to the "President," additional, for R.N.A.S., to date June 26th.

Admiralty, November 23rd.

Temp. Surgeon A. G. Holman to the "President," additional, for R.N.A.S., Nov. 22nd.

Petty Officer (Corpl. R.M.L.I.) G. F. Moody and H. J. Horsey, D. H. Daly, D. R. B. Bentley, A. H. Paull, J. E. S. Alexander, A. G. Morris, R. Jarman, H. G. B. Linnell, A. E. Lettington, C. W. B. Colling, McC. S. Bowley, L. L. Baldwin, and H. S. Holman entered as Proby. Flight Officers for temp. service, all to date Nov. 26th.

Admiralty, November 25th.

Flight-Comdr. C. R. Finch-Noyes promoted to rank of Squadron Comdr., date June 30th.

Royal Flying Corps (Military Wing).

London Gazette, November 21st.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts (on prob.) are confirmed in their rank: R. G. Watts, S. F. Feast, T. M. Wilson, A. E. Blackmore, J. J. Scaramanga, G. Barfoot-Saunt, J. D. V. Holmes, G. Dennison, L. B. Crough. The under-mentioned to be 2nd Lieuts. (on prob.): R. F. P. Hocker; Oct. 19th. R. A. W. Collet; Oct. 30th.

London Gazette Supplement, November 22nd.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: J. R. McDonnell, G. Urquhart, J. D. Smith, E. E. Moodey, C. E. Oxendale, F. Jewell, H. Haycock, B. W. Pitt, W. W. Hall, H. L. U. Clark. The under-mentioned officers of the Australian Imperial Force to be 2nd Lieuts. (on prob.):—Oct. 23rd: Capt. H. A. Hammersley. Lieuts.: G. A. Mitchell, C. R. J. Thompson, S. P. Ashton, H. J. Lane, L. R. Bradbury, H. N. S. Skeffington, J. C. Foden, W. R. Keast, H. D. Luxton, T. L. Gitsham. G. W. Foreman; Oct. 24th. W. W. Vick; Oct. 30th. 2nd Lieuts.:—Oct. 23rd: R. S. Phelan, A. D'A. Sutherland, P. E. Scrivener, A. Burns, A. S. Shepherd, H. Ross. J. G. Wilson to be 2nd Lieut. (on prob.); Nov. 13th.

London Gazette Supplement, November 23rd.

Squadron Commanders.—From Flight-Comdrs., and to be Temp. Majors whilst so employed:—Nov. 1st: Capt. H. Petre, M.C., Commonwealth Mil. Forces; Capt. B. E. Smythies, R.E.; Capt. E. M. Murray, M.C., Queen Victoria's Own Corps of Guides, Ind. Army; Lieut. (Temp. Capt.) W. B. Hargrave, Suff. R. (T.F.); Capt. the Hon. L. J. E. Twistleton-Wykeham-Fiennes, Oxf. and Bucks. L.I., and to be secd.; Temp. Capt. B. P. Greenwood, Gen. List; Lieut. (Temp. Capt.) W. S. Douglas, M.C., R.F.A., S.R.; Lieut. (Temp. Capt.) K. K. Horn, S.R.; Lieut. (Temp. Capt.) R. Egerton, M.C., R. Ir. Fus.; Lieut. (Temp. Capt.) H. MacD. O'Malley, S.R.

Flight Commanders.—Major O. M. Conran, R. Lanc. R.; Nov. 1st. From Flying Officers, and to be Temp. Capts. whilst so employed: Temp. Lieut. G. H. Walker, Gen. List; Oct. 12th. Temp. 2nd Lieut. S. F. Browning, Gen. List; Oct 17th. 2nd Lieut. P. C. Garratt, S.R.; Oct. 21st. 2nd Lieut. W. A. C. Morgan, M.C., Welsh R.; Oct. 30th. Nov. 1st: Temp. Lieut. F. L. Robinson, M.C., Gen. List; Lieut. P. A. O. Peask, R. Ir. Rif. Nov. 3rd: 2nd Lieut. (Temp. Lieut.) T. A. Tillard, Norf. Yeo. (T.F.); 2nd Lieut. C. S. Duffus, M.C., S.R. 2nd Lieut. C. B. Bond, Middx. R., S.R.; Nov. 6th. Nov. 8th: Temp. 2nd Lieut. L. O. Crowther, Gen. List; 2nd Lieut. H. B. Prior, S.R. Nov. 10th: Temp. Lieut. H. J. Payn, R.E., S.R.; 2nd Lieut. (on prob.) (Temp. Lieut.) T. R. Irons, York and Lanc. R., S.R.; Temp. 2nd Lieut. W. Sowrey, Gen. List; 2nd Lieut. R. H. Jarvis, S.R. 2nd Lieut. (Temp. Lieut.) F. R. Hardie, 3rd Hrs.; Nov. 14th.

Flying Officers.—Temp. Lieut. F. L. Robinson, M.C., Gen. List, from a Flying Officer (Ob.); Oct. 31st, but with seniority from June 8th, 1916. Nov. 2nd: Temp. Lieut. A. E. Illingworth, Northd. Fus., and to be transfd. to Gen. List; Temp. Lieut. B. S. Cole, Glouc. R., and to be transfd. to Gen. List; 2nd Lieut. B. W. Pitt, S.R.; Temp. 2nd Lieut. D. E. Davies, Gen. List. Nov. 3rd: Temp. 2nd Lieut. H. Butler, York. R., and to be transfd. to Gen. List; Major A. S. W. Dore, Worc. R. (T.F.); 2nd Lieut. F. L. Carter, E. Surr. R., and to be secd.; Temp. 2nd Lieut. H. O. W. Hill, Gen. List; 2nd Lieut. J. J. Scaramanga, S.R.; Temp. 2nd Lieut. R. Hopper, Gen. List.

Adjutant.—Temp. Lieut. R. Addenbrooke-Prout, R.A., and to be transfd. to Gen. List; Nov. 13th.

Equipment Officer, 2nd Class.—2nd Lieut. (Temp. Lieut.) H. F. Anns, London R. (T.F.), from a Staff Lieut. at the War Office, and to be retain his temp. rank whilst so employed; Nov. 8th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. H. G. Waterall, Gen. List; Sept. 8th. Oct. 12th: 2nd Lieut (Temp. Capt.) C. Ingram, Kent Cyclist Bn. (T.F.); 2nd Lieut. (on prob.) H. E. Jarman, S.R. Oct. 31st: Temp. 2nd Lieut G. B. Monkman, Manch. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. C. S. Edwards, Gen. List; 2nd Lieut. (on prob.) E. Butler, S.R.; 2nd Lieut. (on prob.) W. T. Davis, S.R.; 2nd Lieut. L. B. Crough, S.R.; 2nd Lieut. H. H. Greig, Res. of Off.; Temp. 2nd Lieut. (on prob.) A. W. H. Phillips, Worc. R., and to be transfd. to Gen. List; 2nd Lieut. G. D. Harrison, S.R.; Temp. 2nd Lieuts., Gen. List: M. P. Mullery, N. Glover, R. J. Muxworthy; 2nd Lieut. J. H. B. Foss, S.R.; 2nd Lieuts, S.R.: W. W. Hall, F. Jewell, E. E. Moodey, C. E. Oxendale; Temp. 2nd Lieut. (on prob.) E. H. Hooper, Gen. List.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) resign their commissions: Nov. 24th: E. D. Abbott, W. L. Alison, W. C. Matthews.

London Gazette, November 24th.

Flying Officers (Observers).—Temp. Lieut. D. H. Scott, M.C., Army Cyclist Corps, and to be transfd. to Gen. List; Oct. 18th. Oct. 26th: Lieut. L. H. Jefferson, 11th Hrs., and to be secd.; Temp. Lieut. F. R. C. Cobbold, Suff. R., and to be transfd. to Gen. List; 2nd Lieut. H. M. Golding, Glouc. R., S.R., and to be secd. Oct. 27th: Capt. G. M. Moore, R. Berks. R., S.R.; Temp. 2nd Lieut. G. A. P. Upston, Glouc. R., and to be transfd. to Gen. List; 2nd Lieut. I. M. Harris, K.R. Rif. C., S.R.; Temp. 2nd Lieut. H. G. Ainsworth, Welsh R., and to be transfd. to Gen. List. Oct. 28th: Lieut. W. B. Farrington, Notts. and Derby R., S.R., and to be secd.; Lieut. W. G. Meggitt, Welsh R., S.R., and to be secd.; 2nd Lieut. J. E. MacLennan, Sco. Rif., and to be secd.; Temp. 2nd Lieut. A. W. Rowlands, A.S.C., and to be transfd. to Gen. List; Temp. 2nd Lieut. H. Scandrett, Norf. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) A. E. Godfrey, Gen. List.

Equipment Officers, 2nd Class.—From Equipment Officers, 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Nov. 1st: 2nd Lieut. A. W. Cott, S.R.; 2nd Lieut. J. N. D. Heenan, S.R.

Memoranda.—2nd Lieut. (on prob.) N. Goodwin, from R.F.C., S.R., to be Temp. 2nd Lieut. on Gen. List for duty with R.F.C.; Nov. 4th. The under-mentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Corpl. T. Jones, from Lond. Electrical Engrs., R.E. (T.F.); Oct. 30th. L.-Corpl. F. J. Standerwick, from Lond. R. (T.F.); Nov. 13th. Flight-Sergt. C. P. H. Gunyon, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Nov. 4th.

Supplementary to Regular Corps.—The appointment of 2nd Lieut. (on prob.) G. T. Bridgewater, notified in the *Gazette* of Sept. 26th, is antedated to Sept. 3rd. The appointment of 2nd Lieut. (on prob.) H. B. D. Grazebrook, notified in the *Gazette* of Oct. 7th, is antedated to Sept. 7th. The appointments of the under-mentioned 2nd Lieuts. (on prob.), notified in the *Gazette* of Oct. 17th, are antedated as follows: To Sept. 7th: H. H. Leage, J. H. Fletcher, W. L. Shaw, A. Graham. J. F. B. Smith to Sept. 10th. W. H. G. Furnivall to Oct. 2nd. The appointment of 2nd Lieut. (on prob.) J. Paradise, notified in the *Gazette* of Oct. 20th, is antedated to Sept. 7th. The appointment of 2nd Lieut. J. D. Campion, notified in the *Gazette* of Oct. 23rd, is antedated to Sept. 7th. 2nd Lieut. (on prob.) G. T. Bridgewater is confirmed in his rank.

The London Gazette Supplement, November 25th.

The under-mentioned to be 2nd Lieuts. (on prob.) :—*For duty with R.F.C.*—Oct. 25th: Pte. C. H. Bidmead, from A.S.C.; Pte. J. A. York, from Can. A.S.C.; Dr. H. B. Griffiths, from Can. A.S.C. Oct. 26th: Sergt. H. L. Pateman, from R.F.C.; 1st Cl. Air-Mech. E. W. Dexter, from R.F.C.; Pte. L. G. Banks, from Lond. R. (T.F.). Oct. 27th: Flight-Sergt. W. F. Leech, from R.F.C.; Sergt. J. R. W. Thompson, from R.F.C.; Sergt. S. Cockerell, from R.F.C.; Acting-Sergt. A. Matthews, from A.O.C.; Pte. C. J. Baylis, from Can. A.S.C.

Flight-Commanders.—Nov. 1st: Major I. A. E. Edwards, R.A., from a Flying Officer. From Flying Officers, and to be Temp. Capts. whilst so employed: Lieut. R. B. Mansell. Glouc. R., (T.F.); Temp. 2nd Lieut. L. E. Brown, Gen. List; Lieut. W. A. C. Heyman, 4th Hrs.; Lieut. H. H. Balfour, K.R. Rif. C., S.R.; Lieut. C. M. B. Chapman, M.C., E. Kent R.; Lieut. R. C. Gallop, Sco. Rif.; Lieut. H. S. Ward, S.R.; 2nd Lieut. (Temp. Lieut.) C. L. Bullock, Rif. Brig., S.R.; Temp. 2nd Lieut. C. E. Foggin, Gen. List; 2nd Lieut. J. Stuart, R. Innis. Fus.; 2nd Lieut. H. Fisher, S.R. Temp. Lieut. C. R. Cook, Gen. List; Nov. 10th.

Flying Officers.—Temp. Lieut. W. P. Bowman, W. York. R., and to be transfd. to Gen. List; July 4th. Temp. 2nd Lieut. L. N. Graham, W. York. R., and to be transfd. to Gen. List; July 5th. Temp. Capt. G. M. Boumphrey, attd. S. Lan. R.; Nov. 2nd. Nov. 3rd: Temp. 2nd Lieut. (on prob.) W. H. N. Shakespeare, Gen. List; Temp. Capt. H. E. Reynell, R. Highrs., and to be transfd. to Gen. List; 2nd Lieut. (Temp. Lieut.) W. P. Brown, Lovat's Scouts Yeo. (T.F.). Nov. 4th: Temp. 2nd Lieut. (on prob.) J. W. Foreman, Gen. List; Temp. 2nd Lieut. (on prob.) R. E. G. Fulljames, Gen. List. 2nd Lieut. (on prob.) D. G. A. Allen, Durh. L.I., S.R., from a Flying Officer (Ob.); Nov. 5th, but with seniority from April 1st. Nov. 6th: Temp. 2nd Lieut. A. D. Finney, Gen. List, from a Flying Officer (Ob.), with seniority from Oct. 22nd, 1915: 2nd Lieut. H. Haycock, S.R.

Equipment Officers, 2nd Class.—From Equipment Officers, 3rd Cl.: Lieut. S. A. Laird, S.R.; Sept. 26th. Nov. 1st: Lieut. D. C. James, Worc. R., S.R.; Lieut. M. D. McFarlane, Middx. R.; and to be secd.; 2nd Lieut. E. McEvoy, Oxf. and Bucks. L.I., and to be Temp. Lieut. whilst so employed. Capt. H. Le Jeune, S.R.; Nov. 10th.

Equipment Officers, 3rd Class.—Nov. 3rd: 2nd Lieuts., S.R.: J. D. Smith, J. R. McDonnell, 2nd Lieut. (on prob.) P. R. Aitken, S.R.

Memoranda.—2nd Lieut. (on prob.) T. H. Cooper, from R.F.C., S.R., to be Temp. 2nd Lieut. (on prob.), Gen. List, for duty with R.F.C.:—Nov. 5th: J. P. Campbell to be Temp. 2nd Lieut. (without the pay and allowances of that rank) whilst specially employed; Nov. 26th. E. J. Nathan to be Temp. 2nd Lieut. (on prob.); Nov. 13th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: E. P. Lyon, E. Butler, G. W. Longstaff. The under-mentioned to be 2nd Lieuts. (on prob.) :—Oct. 19th: M. J. Morris, N. R. Anderson, A. C. Atkey, C. S. Bellamy, H. B. Billings, J. W. Boulter, C. H. Cameron, J. G. Crang, C. M. De Rochie, M. Lavoie, G. I. D. Marks, S. W. Graham, M. G. Gunn, N. E. Kelk, R. H. Lloyd, W. G. M. Browne, L. B. Hyde-Pearson, B. A. Doran, B. J. Glynn, J. L. Fry, A. E. Watts, W. H. Weller, E. R. Tucker, U. H. Seguin, W. F. Willis, F. G. Reid. C. H. Sharpe; Nov. 4th.

London Gazette Supplement, November 27th.

Flight Commander.—Temp. Lieut. A. M. Thom, M.C., Gen. List; Nov. 1st.

Flying Officers (Observers).—Temp. 2nd Lieut. R. F. Power, R.A., to be transfd. to Gen. List; Sept. 7th. Temp. Lieut. G. F. C. Rawlings, R.A., and to be transfd. to Gen. List; Oct. 6th. Oct. 8th: Lieut. (Temp. Capt.) F. W. Hudson, Norf. R. and to be secd.; Lieut. H. St. Clair Smallwood, Ind. Army, Res. of Off.; 2nd Lieut. H. Richardson, Norf. R., and to be secd.; 2nd Lieut. P. Ainsworth, Manch. R., T.F. Oct. 21st: Temp. Lieut. H. J. L. Cappel, Gen. List; Temp. 2nd Lieut. H. A. Pearson, R.A., and to be transfd. to Gen. List; 2nd Lieut. D. Clark, High. Brig., R.F.A., T.F.; 2nd Lieut. B. K. D. Robertson, Glouc. R., T.F. Temp. 2nd Lieut. C. T. Richards, R.A., and to be transfd. to Gen. List; Oct. 24th. 2nd Lieut. L. E. Dawson, 7th Australian Light Horse; Oct. 26th. Temp. 2nd Lieut. (on prob.) C. W. Adkin, Gen. List; Nov. 1st. Nov. 2nd: 2nd Lieut. (Temp. Lieut.) A. M. Mitchell, A.S.C., and to be secd.; Temp. 2nd Lieut. E. Roberts, Welsh R., and to be transfd. to Gen. List. Nov. 5th: Temp. 2nd Lieut. R. Robertson, Gen. List; Temp. Lieut. J. W. Mathews, A.S.C., and to be transfd. to Gen. List; Temp. Lieut. J. S. Dunkerley, Sco. Rif., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) W. S. Wright, Leic. R. and to be transfd. to Gen. List; 2nd Lieut. H. Munden, Som. L.I., and to be secd.; Temp. 2nd Lieut. P. C. Hollingsworth, Gen. List. Temp. 2nd Lieut. G. F. Ward, Army Cyclist Corps, and to be transfd. to Gen. List: Nov. 9th.

Special Appointment (graded as a Park Commander).—Capt. Lord R. E. Innes-Ker, I. Gds., Spec. Res., from an Equipment Officer, 1st Cl., and to be Temp. Maj. whilst so employed; Nov. 8th.

Equipment Officer, 3rd Class.—Temp. 2nd Lieut. R. C. Fielder, Gen. List; Nov. 6th.

Memoranda.—Lieut. G. A. Hoghton, R.N.V.R., to be Temp. 2nd Lieut. whilst employed with R.F.C.; Aug. 21st, 1916. Cadet E. T. Driver, from R.A. Cadet School to be Temp. 2nd Lieut. for duty with R.F.C.; Sept. 11th, 1916. 1st Cl. Air Mech. W. A. Andrews, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Nov. 2nd.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) T. M. Coates resigns his commission; Nov. 28th.

Aeronautical Inspection Department.

London Gazette, November 21st.

The under-mentioned to be Temp. Hon. Lieuts. while employed as Assistant Inspectors, A.I.D.:—Aug. 26th: J. B. Ringwood, G. Ramage.

London Gazette, November 24th.

L. F. de Peyrecave to be Temp. Lieut. while employed as Assistant Inspector, A.I.D.; Nov. 1st.

* * *

Vacancies in the R.F.C.

THE Royal Flying Corps has been reopened for recruiting, but no man in medical category "A" (general service) will be accepted unless he is a skilled tradesman, that description being applied only to men who pass very creditably in their trade tests. Coppersmiths, motor cyclists, electricians, fitters and instrument repairers may be accepted, even though fit for general service.

Clerks, draughtsmen, shoemakers and telephonists must be in Class B iii. Cooks have to be in Category B ii., and from this medical class the Royal Flying Corps is seeking to draw coppersmiths, motor cyclists, men for the labour section, painters and technical storemen. Men who will be accepted through either B i. or B ii. are: Motor transport drivers, electricians, engine fitters, instrument repairers, photographers. cabinet makers (as riggers), sailmakers, vulcanisers, men for the balloon party, and Silco plant and balloon riggers.

Those who wish to join as gunner-observers must conform to the standard of fitness required for pilots, and hold a Hythe certificate for machine gunnery. The corps also desires textile fitters (as armourers), acetylene welders and winch drivers and fitters, who must have an intimate knowledge of petrol winches.

The recruiting officer is Major Mitchell, The Polytechnic, Regent Street, W.

A GRAPHICAL METHOD OF DETERMINING BENDING MOMENTS IN CONTINUOUS BEAMS.*

By E. O. WILLIAMS, B.Sc. (Lond.), Designer to the Wells Aviation Co.

The exact calculation of the stresses set up in such a flexible structure as the wings of an aeroplane is a lengthy and tedious process, and one, moreover, which requires for its successful manipulation a trained mathematician if the results are to justify the time and trouble expended upon it. Several approximate methods have been evolved, one, generally known as the R.A.F. method, by Bairstow and Maclachlan, described in report No. 83 of the N.P.L. report for the year 1912–13, while doubtless there are individual constructors who employ the more usual engineering methods. Graphical methods, in connection with this as with so many other problems, are always preferable for practical purposes provided they give results of the required degree of exactitude. The following graphical method, which Mr. Williams has been good enough to communicate to us, is of German origin, and is, we understand, extensively employed on the Continent, where it is known as Ritter's method. It has, in addition to giving results practically identical with those obtained by the exact mathematical solution, the very great advantage that it can, as Mr. Williams points out, be entrusted to an ordinary draughtsman, it is rapidly carried out, and any mistakes, which in mathematical calculations are frequently difficult to trace, will be instantly apparent to the trained eye. The method has so much to recommend it that we firmly believe that, once it becomes generally known, it will be employed almost to the exclusion of all others, and it is therefore with a great amount of confidence that we place it this week before our readers.—ED.

THE method of determining bending moments indicated in the accompanying figures is not, I believe, generally known to engineers in this country, the mathematical solution being usually employed. The graphical method has the advantage that it can be delegated to anyone without a mathematical training, and is much easier to check, as any error in construction is at once obvious to the experienced eye. In the figures five unequal spans are indicated, but of course the method applies to any number of spans. Briefly speaking, the method is as follows: Set out the spans to any convenient scale and determine the "fixed points" as shown in Fig. 1. Each span is divided into three equal parts by the divisional points h_1, h_2, h_3, &c. From h_2 set off to the left $h_2k_1 = \frac{l_1}{3}$; from h_3 set off to the left $h_3k_2 = \frac{l_2}{3}$; from h_4 set off to the left $h_4k_3 = \frac{l_3}{3}$, &c. Through the points k_1, k_2, k_3, k_4, &c., thus found draw vertical lines. From A draw a line at any convenient angle intersecting the vertical line through k_1 at g_1. Through the right-hand divisional point h_1 of the span AB draw another vertical line intersecting Ag_1 in f_1. Produce f_1B until it intersects the vertical line through the left-hand divisional point h_2 of the span AB in m_2, and join g_1m_2 cutting the line BC in T, which is the left-hand fixed point of span BC. Draw Tg_2 at any convenient angle, and continue as previously, finding V, the left-hand fixed point of the span CD. In the same manner find X and Z. The right-hand fixed points, S, U, W and Y, are found in a similar manner, starting by drawing a line from the point F through m_5 intersecting the vertical line through k_4 in n_5. Join f_4n_5 cutting DE in Y, which is the right-hand fixed point of span DE.

The right-hand fixed point, W, of span CD is found by drawing a line from Y through m_4 proceeding as previously, and in the same manner all the remaining fixed points are located. When this has been accomplished, the next step is to utilise the "fixed points" for determining the effect of the bending moment in one span on the other spans of the continuous beam. This is done by constructing on any particular span the freely supported bending moment diagram due to the load on that span. The closing line will, of course, depend on the distribution of the load on the span in question, and methods are indicated for different load distributions in Figs. 2, 3, 4, 5 and 6.

In connection with bending moments in aeroplanes Fig. 2 is the most important, since it deals with a uniformly distributed load. Commencing with any of the spans the bending moment on that span is first determined. In the case of a uniformly distributed load the diagram is, of course, a parabola. The point K is on the centre line of the span. Join KB and KC, cutting perpendiculars through T and U in L and M respectively. $NLMO$ is then the closing line. By continuing the closing line through the appropriate fixed points and supports, the bending effect in adjacent spans is at once given. If no other spans are loaded the solution is then complete. As, however, the other spans usually are loaded, at any rate in an aeroplane, it becomes necessary to determine the effect of these loadings. This is done by constructing on all spans the appropriate freely supported bending moment diagram and determine the closing lines, which continue through fixed points and supports.

Now sum up all the bending moments at any particular point, having, of course, due regard to sign. When the closing line is below the base line the ordinate between it and the base line represents negative bending moment and *vice versa*. The method is illustrated in Figs. 7 and 8. In aeroplane spars subjected to direct axial compression, the bending moment due to lateral load at the centre of the spar is increased by an amount equal to the compressive force multiplied by the total deflection, but the bending moment at the supports remains practically unaltered. The exact solution is involved, but as a first approximation it may be assumed that, owing to the increase in the centre bending moments, the points of contraflexure move half-way towards the supports. If l_1 is the length of the span, and l_c the length between the points of contraflexure on the continuous bending moment diagram, the assumption is that the length between the points of contraflexure of the axially loaded beam is $\frac{l_1 + l_c}{2}$. The following

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A GRAPHICAL METHOD OF DETERMINING BENDING MOMENTS IN CONTINUOUS BEAMS.

(*Strictly Copyright.*)

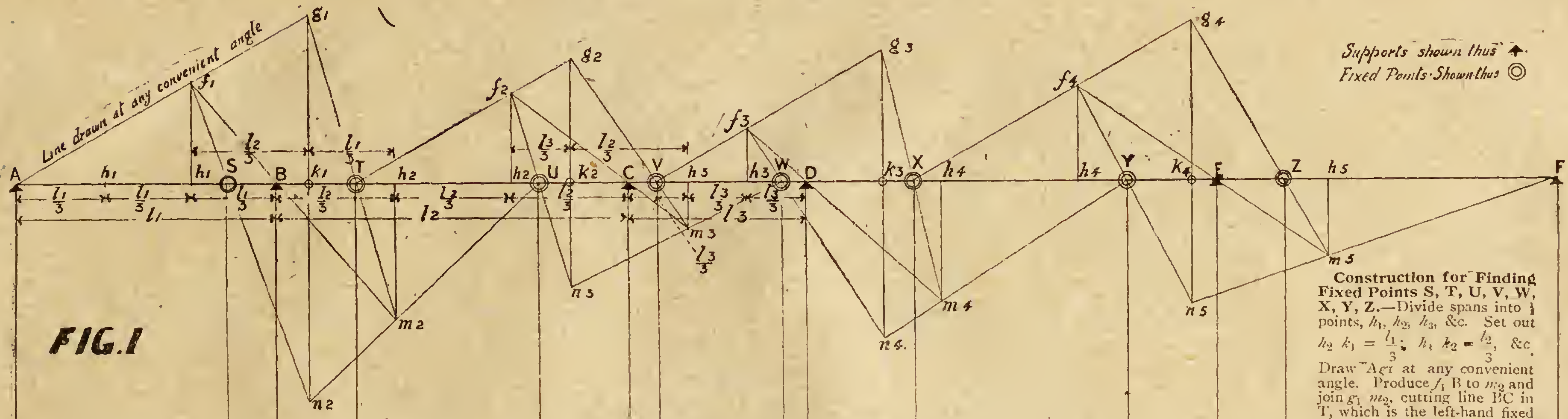

FIG. 1

Construction for Finding Fixed Points S, T, U, V, W, X, Y, Z.—Divide spans into $\frac{1}{3}$ points, h_1, h_2, h_3, &c. Set out $h_2\,k_1 = \frac{l_1}{3}$; $h_1\,k_2 = \frac{l_2}{3}$, &c. Draw Ag_1 at any convenient angle. Produce f_1 B to m_2 and join $g_1\,m_2$, cutting line BC in T, which is the left-hand fixed point of span BC. Draw Tg_2 at any convenient angle and continue as previously, finding V, the left-hand fixed point of span CD. Likewise find X and Z. The construction below line AF determines right-hand fixed points.

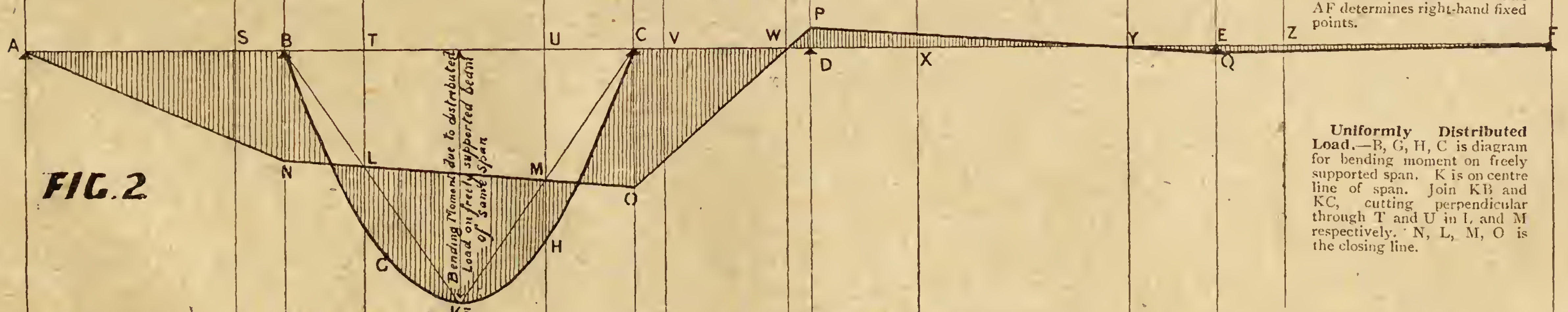
A
S
B
T
U
C
V
W
P
D
X
Y
E
Q
Z
F
N
L
M
O
G
H
K
Bending Moment due to distributed Load on freely supported beam of same span

FIG. 2

Uniformly Distributed Load.—B, G, H, C is diagram for bending moment on freely supported span. K is on centre line of span. Join KB and KC, cutting perpendicular through T and U in L and M respectively. N, L, M, O is the closing line.

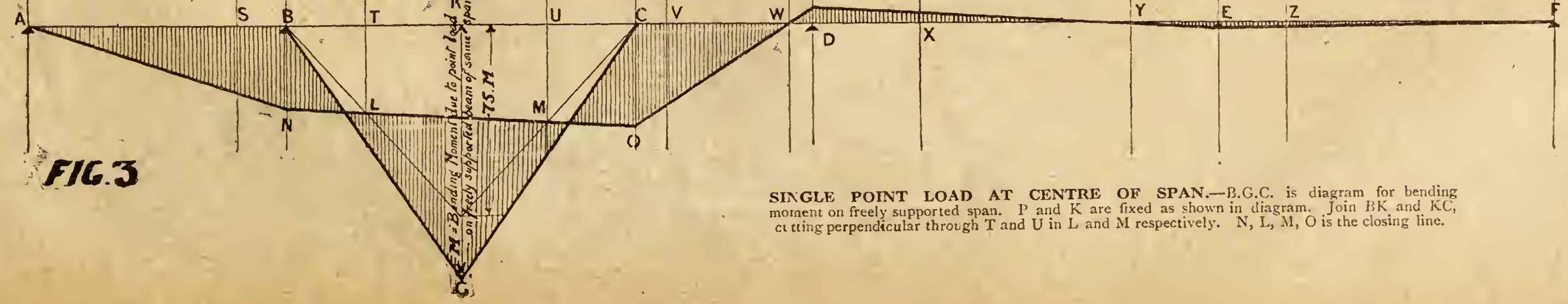
A
S
B
T
U
C
V
W
D
X
Y
E
Z
F
N
L
M
O
G
·75 M
M = Bending Moment due to point load on freely supported beam of same span

FIG. 3

SINGLE POINT LOAD AT CENTRE OF SPAN.—B.G.C. is diagram for bending moment on freely supported span. P and K are fixed as shown in diagram. Join BK and KC, cutting perpendicular through T and U in L and M respectively. N, L, M, O is the closing line.

A GRAPHICAL METHOD OF DETERMINING BENDING MOMENTS IN CONTINUOUS BEAMS (*continued*).

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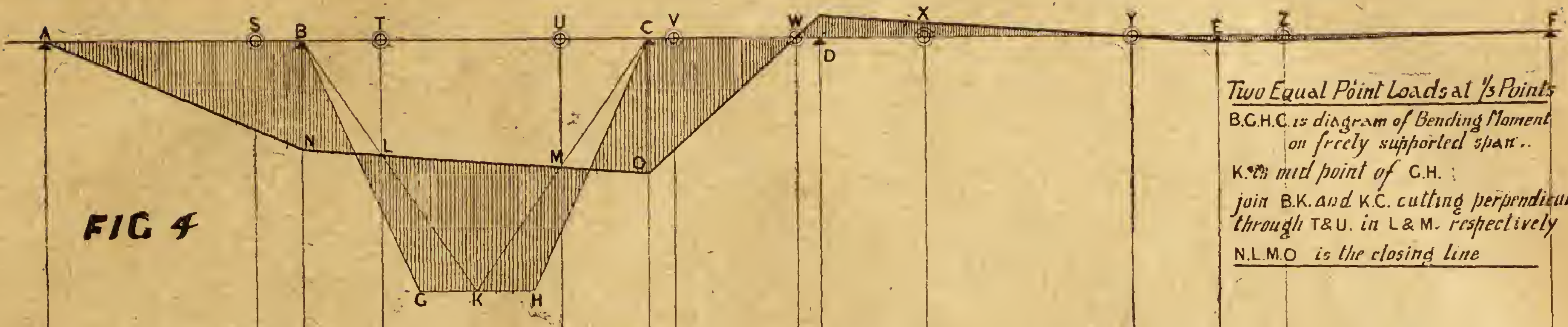

FIG 4

Two Equal Point Loads at 1/3 Points

B.G.H.C. is diagram of Bending Moment on freely supported span..

K. is mid point of G.H. :

join B.K. and K.C. cutting perpendiculars through T&U. in L & M. respectively

N.L.M.O is the closing line

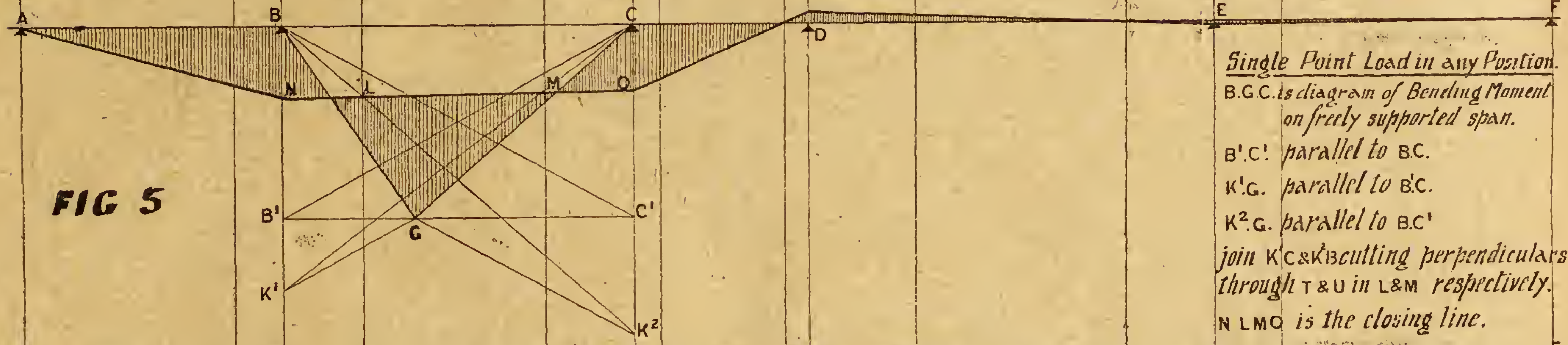

FIG 5

Single Point Load in any Position.

B.G.C. is diagram of Bending Moment on freely supported span.

B'.C'. parallel to B.C.

K'.G. parallel to B'C.

K².G. parallel to B.C'

join K'C & K²B cutting perpendiculars through T & U in L&M respectively.

N LMO is the closing line.

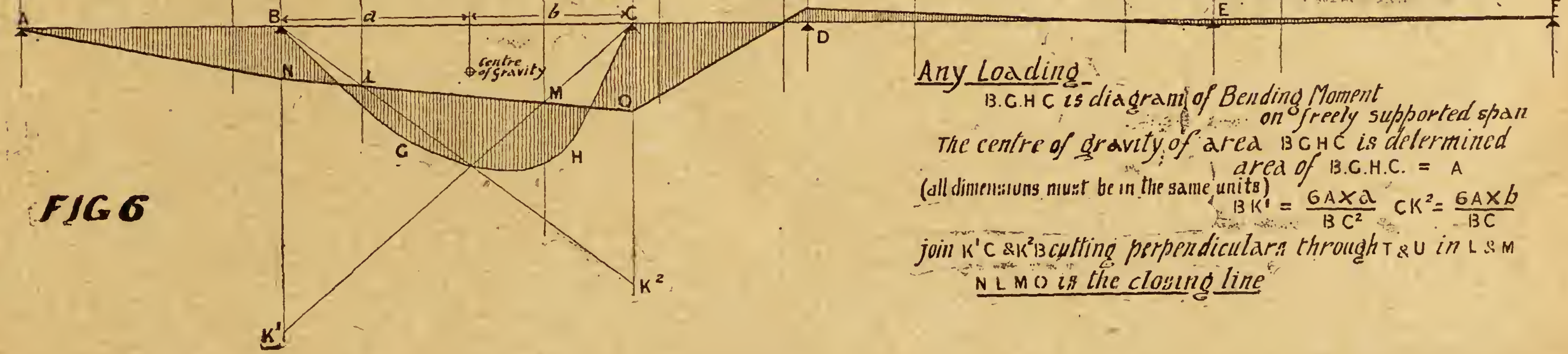

FIG 6

Any Loading

B.G.H C is diagram of Bending Moment on freely supported span

The centre of gravity of area BGHC is determined

area of B.G.H.C. = A

(all dimensions must be in the same units)

$$BK' = \frac{6A \times a}{BC^2} \quad CK^2 = \frac{6A \times b}{BC}$$

join K'C & K²B cutting perpendiculars through T & U in L & M

N L M O is the closing line

A GRAPHICAL METHOD OF DETERMINING BENDING MOMENTS IN CONTINUOUS BEAMS *(continued).*

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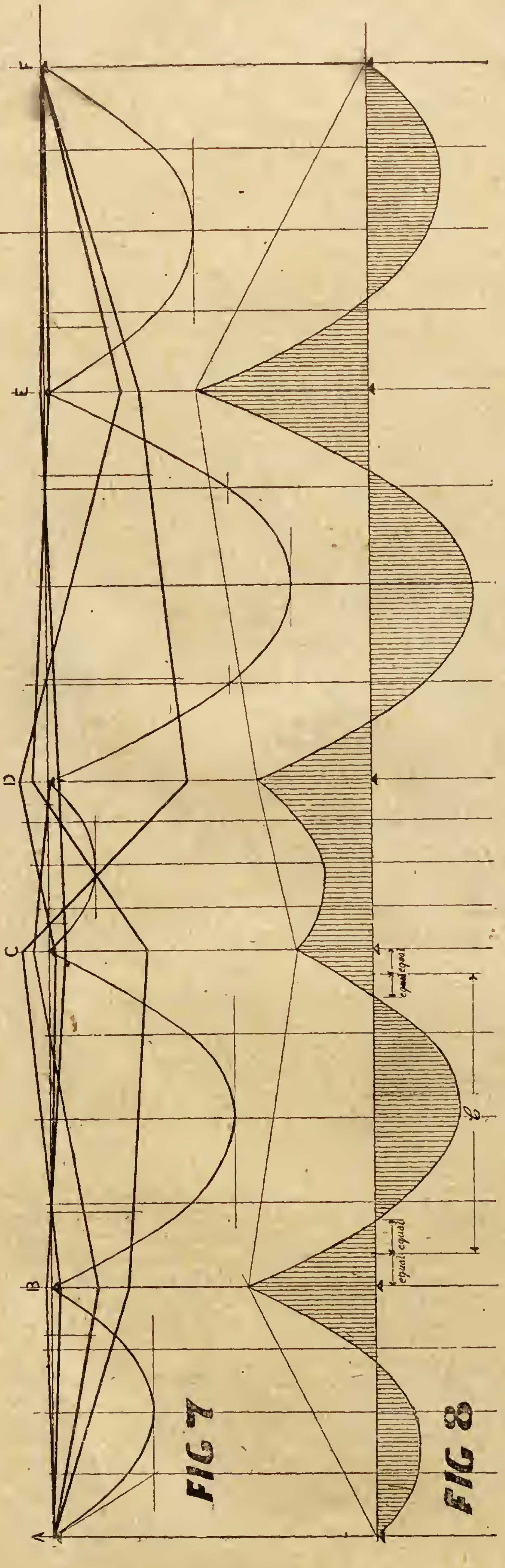

FIG 7

FIG 8

formula for a laterally loaded strut can then be applied to a strut of length $\frac{l_1 + l_c}{2}$.

$$f_c = \frac{w\left(\frac{l_1 + l_c}{2}\right)^2}{8\,Z} \cdot \left(\frac{P_e}{P_e - P}\right) + \frac{P}{A}$$

Where—

fc = maximum compressive stress in lbs. per sq. in.

w = lateral load on spar in lbs. per inch run.

Z = section modulus of spar.

P_e = Euler's limiting value for the spar on length $\frac{l_1 + l_c}{2}$ considered free ended.

P = end compression on spar in lbs.

A = Area of spar section in sq. inches.

* * *

"X" AIRCRAFT RAIDS.

In view of the decision of the Government not to allow details of places visited by enemy aircraft to be published, we are, as before, giving to each one an index number. Eventually, when details are available, we shall give the respective information under these index numbers, which will facilitate easy reference to each particular raid.

"X 54" Raid, November 27th–28th.

The following *communiqué* from the Field-Marshal Commanding-in-Chief, Home Forces, states :—

November 28th, 1.20 a.m.

"Hostile airships crossed the North-Eastern Coast last night. Bombs are reported to have been dropped at several places in the Northern Counties, but no reports as to casualties or damage have yet been received."

November 28th, 11.15 a.m.

"A number of hostile airships approached North-East Coast of England between 10 and 11 p.m. yesterday. Bombs were dropped in various places in Yorks and Durham, but damage is believed to be slight. One airship was attacked by an aeroplane of the R.F.C. and brought down in flames. Fell in sea off coast of Durham.

"Another airship crossed into North Midland counties and dropped some bombs at various places. On her return journey she was repeatedly attacked by aeroplanes and by guns. She appears to have been damaged, for the last part of her journey was made at very slow speed, and she was unable to reach the coast before day was breaking. Near Norfolk coast she apparently succeeded in effecting repairs, and was proceeding east at high speed and at altitude of over 8,000 ft., when she was attacked 9 miles out at sea by four machines of the R.N.A.S. and an armed trawler, and brought down in flames at 6.45 a.m."

November 28th, 4.10 p.m.

"The latest police reports show that the damage and casualties caused by last night's air raid were very slight, although over 100 bombs are known to have been dropped. One woman died from shock, while five men, seven women and four children were injured. In one town fifteen houses were seriously, and twenty slightly, damaged. At the other places at which bombs were dropped the damage was insignificant. No damage of military importance was caused."

"X 55" Raid, November 28th.

November 28th, 3 p.m.

"Between 11.50 and twelve noon this morning six bombs were dropped on London by a hostile aeroplane, flying at a great height above the haze. Four persons were injured—one, a woman, seriously. The material damage is slight."

Later.

"Official police reports show that nine persons were injured in London this morning by the bombs dropped by the hostile aeroplane."

Admiralty, November 29th, 12.22 a.m.

"The Commodore of Dunkirk has been informed by the French authorities that they brought down an aeroplane at 2.15 p.m. to-day (Tuesday), carrying two naval lieutenants, and with a large scale map of London on board."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL COMMITTEE MEETING.

A SPECIAL MEETING of The Committee was held on Wednesday, the 22nd inst., when there were present: Prof. A. K. Huntington, in the Chair; Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Lieut.-Commander H. E. Perrin, R.N.V.R. (in attendance), and the Assistant Secretary.

Election of Members.—The following New Members were elected:—

Lieut.-Commander Nicolas d'Andreeff (Imperial Russian Navy).
Flight-Lieut. Stafford St. George Conway Belfield, R.N.
Lieut. A. Norman Benge, R.F.C.
Lieut. Percy George Burton, R.N.V.R.
Alfred Gollin.
Flight-Lieut. Alfred Sebastian Goodwin, R.N.
Lieut. George Grossmith, R.N.V.R.
Lieut. H. Hemming (Worcestershire Regt.).
2nd Lieut. Francis Gordon Hogarth, R.F.C. (S.R.).
Lieut. Horace Howard, R.N.V.R.
Fleet Paymaster Frank Lenn, R.N.
Flight-Lieut. Edward Alexander de Lossy de Ville, R.N.
Capt. Stephen William Price, R.F.C.
2nd Lieut. Neville Julian Rich, R.E.
Flight-Commander Richard Sterling Robinson, R.N.
2nd Lieut. Alexander John Murray Ross.
Capt. Helperus Andrias Van Ryneveld, R.F.C.
Lieut. H. V. Stammers, R.F.C.
Flight-Lieut. Siegfried Rickards Watkins, R.N.
Capt. B. T. Monier-William, R.G.A.

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

New Club Premises.

The arrangements for the alterations, decorations, furnishing, &c., of the New Club House are in the hands of a special Committee, and the work is progressing very satisfactorily. There will be a billiard room, smoking lounges, buffet, reading and writing room, dining room and bedrooms. The house is situated within three minutes' walk of the present Club premises.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Nov. 21st, 1916	10,999	7	9
Collected at the Westland Aircraft Works, Yeovil (Fifty-eighth contribution)	0	17	8
From the Ship's Company of H.M.S. "Campania"	10	0	0
Staff and Workers of Gwynnes, Ltd. (Twenty-eighth contribution)	8	14	3
Total, November 28th 1916 ..	11,018	19	8

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

The Car.

No. 3, Clifford Street, New Bond Street, W. The new premises of the Royal Aero Club which will be opened in December.

Two American Flyers Dead.

AMERICAN aviation has lost two of its prominent exponents in Antony Jannus and Silas Christofferson. The former, who represented the Curtiss interests, was killed in Russia while testing a large flying boat for the Russian Army on November 4th. Apparently something went wrong with the engine, and the machine fell into a lake.

Silas Christofferson was killed on October 31st, his machine overturning when only 100 ft. up. He was testing at the time a military machine fitted with a new type of control. He was consulting engineer to the Christofferson Aeroplane and Motor Corporation at Redwood City, Cal., and his most noted flight was between San Francisco and Los Angeles over the Tebachapi mountain.

Fatal Accident.

AT an inquest held by the Hounslow coroner on November 25th on Lieut. R. N. Dobbyn, R.F.C., the evidence showed that the machine piloted by the deceased turned too sharply when rising, and the machine dived to earth and took fire. A verdict of "Accidental Death" was returned.

ALLIES' MACHINES IN GERMAN HANDS.

In Germany is published from time to time lists of the British and French machines which they claim to have brought down. The lists are of great interest, since they contain much detailed information as to machines and the fate of the pilots and observers. From the last point of view we regard them as exceedingly valuable, because they clear up the fate of many of those of our gallant airmen who simply figure in our casualty lists as "Missing." We publish below the latest of these lists available. Possibly they are not absolutely complete, but a comparison with our lists shows that they are reasonably so, and are thus very helpful in enabling us to know exactly what has become of many missing officers and their machines.

The list, as we publish it, has a formidable appearance, but when we come to compare it with our own published lists there is, unfortunately, only too much reason to believe that it tells no more than the truth about the terrible toll of life the Flying Services exact as the price of Admiralty of the Air. Heavy as it is, it has to be faced, and such a list as this emphasises the need for further and yet further sacrifice to maintain what we have secured at the price of the devotion of those whose names are enshrined in the Roll of Honour.

BRITISH MACHINES—AUGUST.

Machine.	No.	Engine.	No.	Occupants.
Vickers	—	—	—	Shot down August 1st, Bapaume. Totally burnt.
B.E.	546	Renault	—	Capt. C. W. Snook, 6 Squadron.
English biplane	5,177	—	—	Lieut. H. J. Newton, Sergt. J. A. Ornsby.
Sopwith	5,681	—	—	Lieut. L. Clark, Sergt. A. Walker.
Vickers	384	—	—	Lieut. Machenson, Sapper Eric Mercill.
Martinsyde	7,307	Beardmore	547	Lieut. Turner.
B.E.	7	Renault	—	* Totally burned, shot down Bapaume, August 5th.
Sopwith	—	Gnome	—	Lieut. Blain, C. D. E. Griffith.
B.E.	—	—	—	Capt. Leggat.
Vickers	—	—	—	Lieut. J. A. Mann, other occupant burned.
Avro		—	—	*Shot down August 9th, Bapaume.
Vickers	—	—	—	* Brought down in aerial combat, August 12th.
B.E.	6,549	—	—	2nd Lieut. G. L. Clifford Geen, 19 Squadron.
Seaplane	—	—	—	Lieut. P. C. Tocke, Lieut. C. R. Nival.
B.E.	2,613	Engl. Daimler	—	Lieut. R. T. Griffin, Lieut. Whitehead, 2 Squadron.
Sopwith	—	—	—	Capt. R. G. Hopwood, G. L. Pearce.
Vickers	4,285	Engl. Daimler	475	Lieut. R. D. Walker, Lieut. Smith.
Vickers	5,994	Gnome	30,393	Lieut. Turner.
B.E.	5,445	Renault	—	2nd Lieut. Corbold.
B.E.	6,532	Daimler	25,139	Lieut. A. W. Reynell.
Avro	—	Rhone	—	Lieut. Odling, Lieut. Maze, 70 Squadron.
Morane	173	Rhone	576	Lieut. Beauchamp, Meuryn Wainwright.
B.E.	—	—	—	*Shot down August 26th, totally burned.
Bristol	6,562	Daimler	25,159	Lieut. Briggs.
Bristol	5,836	Austin	642	Lieut. Cairnes, Lieut. Tulloch.
B.E.	—	—	—	*Shot down August 26th.
Martinsyde	—	—	—	Lieut. Strange.
Martinsyde	7,482	Beardmore	449	Capt. Skinner.
Martinsyde	7,479	Daimler	2,435	Lieut. Byrne, 27 Squadron.
Martinsyde	7,299	—	498	*
B.E.	5,235	Daimler	6,903	Lieut. MacIntosh, Lieut. MacFee.

BRITISH MACHINES—SEPTEMBER.

Machine.	No.	Engine.	No.	Occupants.
B.E		Gnome	30,010	Capt. Wilson.
F.E.	4,290	Beardmore	26	Lieut. Bardon, Lieut. Griffin.
Sopwith	—	—	—	*Shot down September 2nd.
F.E.	6,934	Marston	28,425	Lieut. Frank Douglas, Cpl. Junners, 23 Squadron.
Vickers	2,939	—	—	†
Bristol	7,070	—	—	*
Sopwith	—	9 cyl.	—	2 Officers. Shot down September 6th.
Vickers	—	Daimler	255	*
Vickers	—	Gnome, B 692	6,425	A Lieut. Dead. Name unknown.
Unknown	—	—	—	Lieut. Vernon, Lieut. Firbank.
Sopwith	—	110 Clerget	—	2nd Lieut. Organ.
Sopwith	897	—	—	Lieut. Ale, Cpl., name unknown.
Vickers	7,873	Gnome	—	*
Sopwith	895	Gnome	973	Dead. Name unknown.
Nieuport	—	—	—	Lieut. Bowyer, Lieut. Saint.
B.E.	6,583	Renault	20,738	Lieut. Elphinston
B.E.	6,164	Renault	8,232	Lieut. Gilbert Klingenstern.
F.E.	—	—	—	*Shot down September 15th at Hoplincourt.
B.E	4,495	Renault	792	Lieut. Cushing Dougall.
Martinsyde	7,484	Daimler	—	2nd Lieut. Kennedy, 22 Squadron.
F.E.	6,669	Daimler	—	*
Vickers	7,018	Daimler	701	Pilot, Cpl. Rees, Observer ?
F.E.	7,063	—	—	*
Vickers	4,852	6 cyl. Daimler	—	Lieut. F. G. Thierry, Bucks.
F.E.	6,994	Beardmore	662	Lieut. Thomsen, Cpl. J. E. Glover.
B.E.	5,873	—	1,302, W.D. 1,472	Lieut. Patterson.
Sopwith	—	—	—	*Shot down September 17th, Estrées.

* Identity not established.

† Totally wrecked. Occupant: Officer, identity not established. Wings numbered 12941. Rudder, A.M.C. 788.

BRITISH MACHINES—SEPTEMBER. *(Continued.)*

F.E.	—	—	—	*Shot down September 17th, Trescault.
Avro	2,470	Beardmore	337	*
B.E.	2,471	—	3,896	Lieut. Money.
Sopwith	A. 1,913	Rinston	—	*
F.E.	4,934	Beardmore	283	2nd Lieut. Canter, 2nd Lieut. Gray.
F.E.	6,927	Beardmore	556	Pilot, Thomas Jones, Observer, F. A. Hewson.
B.E	—	—	—	*Shot down September 21st at Le Mesnil.
B.E.	6,574	—	—	2nd Lieut. Hederwick.
Sopwith	—	Rinston	—	*Totally burned. Shot down St. Pierre Wood, September 22nd.
B.E.	6,544	Daimler	25,164	Lieut. Hedderwick.
F.E	6,993	Beardmore	681	Lieut. Hunt, Cpl. Law.
Martinsyde	7,475	Daimler	—	*
Martinsyde	174	Daimler	1,420	Bellerby.
Martinsyde	168	—	—	Roberts.
B.E.	7,481	—	1,420	Apparently Non-Com.*
Martinsyde	—	Daimler	—	Lieut. West.
Martinsyde	—	—	—	Edwards.
Martinsyde	7,498	—	G. 100/191	Lieut. Wingfield.
F.E.	—	Beardmore	168	2nd Lieut. Dendrino.
Sopwith	9,705	Clerget	—	2 Officers.*
Avro, 1 seat.	7,495	—	168	Dead.*
Avro, 1 seat	1,568	—	—	
B.E.	2,742	Austin	679	Lieut. A. J. Casson.
Vickers	—	Daimler	6,994	E. C. Landsdahl. Other unknown.
Farman	—	—	—	Pilot Lutoni, Observer, Tillch.
Farman	—	—	—	Dead.* Shot down at Nurle, September 24th.

FRENCH MACHINES—AUGUST.

Caudron	2,059	2 Rhone	6,766, 6,763	2nd Lieut. Marcel Broussart, Cpl. Charles Fouchée.
Nieuport	—	Renault	—	Lieut. Baudry.
Nieuport	833	—	—	Sergt. Maffert.
Morane	143	Rhone	—	*
Nieuport	—	—	—	*Machine burnt Shot down August 4th near Miséry.
Caudron	1,467	2 Rhone	—	Lieut. Excole, 2nd Lieut. Verdier.
Nieuport		—	—	*Machine totally burnt at Guendecourt.
Nieuport	1,520	Clerget	830	Lieut. de Rolland, Cpl. Raymond Boudand.
Nieuport	1,179	Rhone	3,523	Sergt. Hermann Hentsch, Sergt. Felix Veret.
Caudron	306	Clerget	479	Sergt. de Teterline, Pupil Orety.
Caudron	1,309	2 Rhone	332, —	Cpl. Andrée Jouanny, Aspirant Marc Florentin.
Nieuport	1,472	Rhone	4,574	Gras, Escadrille de Chasse 48.
Caudron	—	—	—	Reservist Taubert, Escadrille F. 203.
Nieuport	1,552	Rhone	4,416	Sergt. Danguenger, Escadrille 37.
Nieuport	1,573	—	—	Charles Dumas, Escadrille 57.
Caudron	—	2 Rhone	—	Lieut. Maurice Hunbert, Sergt. Armand Mars.
Caudron	1,325	2 Rhone	3,281, 121	Cpl. Louis M. G. Schütze, Quillard.
Fl. Boat	316	Hispano	—	2nd Lieut. Charles Tesa and Gaston Guesne.

FRENCH MACHINES—SEPTEMBER.

Nieuport	1,276	Clerget	797	Georges Duc.
Nieuport	1,640	—	—	Dead.*
Caudron	1,574	2 Rhone	421, 664	Capt. Bertin.
Nieuport	146	Gnome	930	Lieut. Richard, Sergt. Rousseau.
Caudron	1,457	—	—	2nd Lieut. Antoine Durand, Sergt. Frenche.
Caudron	1,475	—	—	Cpl. Berthes, 2nd Lieut. Claudel.
Nieuport	—	2 Rhone	—	2nd Lieut. Charles Bordes.
Caudron	—	—	—	*Totally burnt. Shot down September 8th.
Nieuport	—	Gnome	850	*
Caudron	—	2 Rhone	5,470, 5,010	*
Caudron	2,61	—	44/42, 44/32	Auguste Trende, Cpl. Marcel Flaurmann.
Nieuport	990	—	—	Spencer.
Nieuport	1,581	Rhone	3,899	2nd Lieut. de Roquefort.
Morane	—	Rhone	—	Capt., name unknown. Totally burned.
Nieuport	3,315	Rhone	821	Cpl. V. Boundet, Escadrille 112.
Nieuport	1,712	Rhone	5,046	2nd Lieut. Guy de Baumville.
Nieuport	3,315	—	—	Lieut. Masquellier.
Nieuport	1,706	Rhone	7,456	Adolf Maria Johann Baptiste le Conte Grandimaison.
Caudron	—	2 Rhone	3,173, 4,148	2nd Lieut. Georg. Vonause, 2nd Lieut. J. Roydellet.
Caudron	2,208	2 Rhone	—	Lieut. Maurice Mumier, Lieut. Andrée Hellon.
Caudron	2,644	Rhone	2,576	Chanoli, Escadrille 124.

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A Zeppelin Raid Heroine.

Bravery on the part of a 13-year-old girl, Violet Buckingham, was rewarded at the Mansion House on November 25th, when the Lord Mayor presented the little heroine with a gold wrist-watch from the Carnegie Hero Trust Fund. The girl, when a bomb damaged the house in which she was, went upstairs, and bringing down a baby carried it to the hospital.

A Super-Zeppelin Wrecked.

Travellers arriving in Amsterdam from Munich last week reported that a super-Zeppelin was wrecked in the storm which raged on November 21st. The airship, which is said to have been on a maiden trip from Fredrichshaven to Wilhelmshaven, was blown out of its original course by the gale, and fell in a wood near Mainz There was one survivor of a crew of 28, while the Zeppelin was wrecked beyond repair.

THE LATE SIR GEORGE WHITE, BART.

It was with tragic suddenness that Sir George White, Bart., the Founder and head of the British and Colonial Aeroplane Co., Ltd., passed away on the 22nd inst. Like Sir Hiram Maxim, the pioneering enterprise of Sir George White in other directions tended to obscure his splendid work in connection with aviation. In May, 1910, when the friends of aviation were comparatively few, Sir George saw the immense possibilities before the art and science, and founded the British and Colonial Aeroplane Co., Ltd., at Filton, near Bristol. Orders were few and far between, but Sir George White persevered, knowing that his enterprise, although it might be early, was bound to justify itself. And so it has proved. As to the progress of the "Bristol" company, as it is more familiarly known the world over, there is no need to recount it at length, for the pages of "Flight" bear witness to that progress.

Sir George White was principally known for his work in connection with another form of transport, tramways, although he started life in a lawyer's office and was for many years head of the firm of Messrs. George White and Co., stockbrokers, of Bristol. In this connection it may be noted that as a mark of respect, the Bristol Stock Exchange was closed for the day of the funeral. Created a baronet in 1904, Sir George White has taken a prominent part in intellectual and philanthropic institutions of Bristol. As president of the Bristol Royal Infirmary, he not only organised the institution, but gave it many lavish gifts to clear it from debt and place its finances on a sound basis. He devoted much of his time to the care of wounded soldiers, for whom the new wing—the King Edward Memorial—of the infirmary was set apart; and to the work of the Red Cross Society, of the Bristol branch of which he was president. He was also president of the Victoria Hospital at Nice, to which he not only contributed £3,000 to enable the hospital to be completed and opened, but he also continued to take the greatest interest in the hospital, and assist it with money, encouragement and advice.

Sir George White, who was born in 1854, is succeeded in the baronetcy by his son, Mr. George Stanley White, who was born in 1882.

The late Sir George White, Bart., the founder of the famous Bristol Aeroplane works.

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THE ROLL OF HONOUR.

Reported by the Admiralty:—

Killed.

Flight Sub-Lieut. A. J. Whetnall, R.N.

Missing.

Flight Sub-Lieut. W. H. Hope, R.N.

Died of Injuries.

1st Air Mech. L. C. de C. Thompson.

Previously reported Missing, now reported Prisoner of War in Germany.

2nd Air Mech. W. Sturdy.

Reported by the War Office:—

Killed.

2nd Lieut. H. E. Martin, R.F.C.
2587 Sergt. F. Barton, R.F.C.
1312 Sergt. G. Bromley, R.F.C.
8824 2nd Air Mech. C. F. Heatley, R.F.C.

Died of Wounds.

4396 1st Class Air-Mech. E. H. C. Foot, R.F.C., att. R.G.A.

Previously reported Missing, now reported Killed.

Lt. K. Mathewson, R.F.C.
Lt. T. Rees, Welsh Fus., attd. R.F.C.

Previously reported Missing, now reported Died of Wounds as Prisoner of War in German hands.

2nd Lt. L. B. F. Morris, Queen's (R.W. Surrey), attd. R.F.C.

Previously Missing, now reported Died as Prisoner of War in Turkish hands.

4473 Sergt. T. N. Palmer, R.F.C.

Died.

4602 1st Air Mech. W. E. Taylor, R.F.C.

Wounded.

Lt. J. V. Barry, A.S.C., attd. R.F.C.
Lt. J. A. G. Brewis, Durham L.I., attd. R.F.C.
2nd Lt. W. W. Fitzgerald, R.F.C.
2nd Lieut. T. R. Gilby, R.W. Kent, attd. R.F.C.
Lt. R. Goudie, Highland L.I., attd. R.F.C.
2nd Lieut. M. R. Helliwell, R.F.C.
2nd Lt. K. S. Henderson, R.F.C.
Capt. H. G. Rickards, R.F.A. and R.F.C.
2nd Lt. A. V. Shewell, Glouc., attd. R.F.C.
2nd Lt. R. V. Tiry, London and R.F.C.
15355 2nd Air Mech. P. Brindle, R.F.C.
9755 2nd Air Mech. M. A. Mann, R.F.C.

Wounded—Shell-Shock.

7912 2nd Air Mech. J. Alexander, R.F.C.
12591 2nd Air Mech. W. G. Foreman, R.F.C.

Missing.

2nd Lieut. R. G. R. Allen, W. Yorks, attd. R.F.C.
Lt. D. H. Bacon, R.F.C.
Lt. T. H. Clark, A.O.D., attd R.F.C.
Capt. S. E. Cowan, M.C., R.F.C.
2nd Lieut. W. C. Crawford, R.F.C.
2nd Lt. G. Doughty, R. Scots, attd. R.F.C.
2nd Lieut. G. S. Hall, R.F.C.
2nd Lieut. J. C. Lees, R. Scots F. and R.F.C.
2nd Lieut. D. A. Macneill, R.F.C.
2nd Lieut. W. S. Fitz R. Saundby, Yorks, attd. R.F.C.
2nd Lt. L. F. Struben, Dragoon Gds., attd. R.F.C.
24715 Sergt. P. Snowdon, R.F.C.

Previously reported believed Taken Prisoners at Kut-el-Amara, now reported Prisoners of War.

4475 Sergt. F. Read, R.F.C.
4136 1st Air Mech. S. B. Welch, R.F.C.

Correction: **Killed.**

2nd Lt. C. H. Bidmead, should read General List (not Shropshire L.I.) and R.F.C.

THE DEATH OF SIR HIRAM MAXIM.

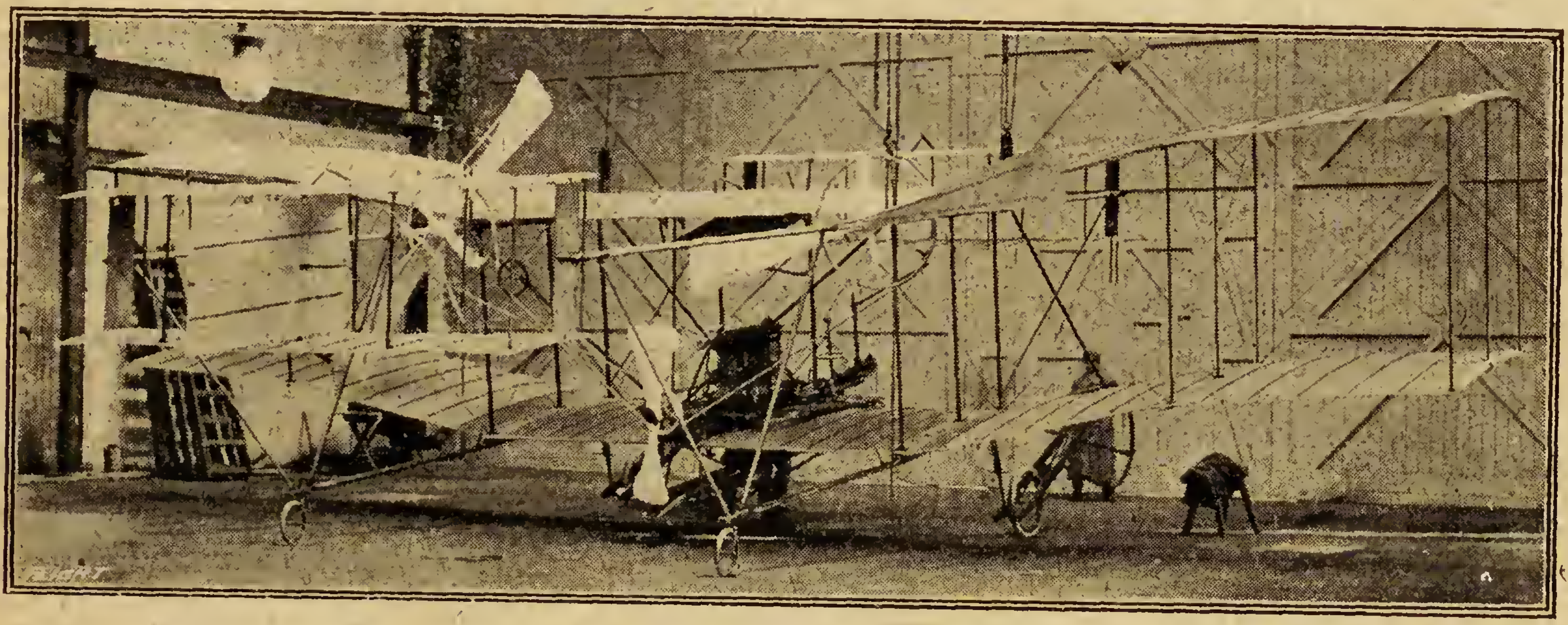
By the death of Sir Hiram Maxim aviation has lost one of its notable pioneers, although the world-fame brought to Sir Hiram by his invention of the Maxim gun overshadowed his work in connection with aeronautics. Being of a very mechanical turn of mind, it was, perhaps, not unnatural that he should attack the problem of making a machine to navigate the air, and in 1894 he experimented at Baldwyn's Park, Bexley, with a giant biplane fitted with a steam engine of 400 h.p So sure was the inventor that the machine would lift, that he had special guards fitted to the track to prevent the aeroplane rising more than a few inches. And they proved its undoing, for the lift led to the breaking of one of the axles, while one of the guards was torn up and catching the propeller smashed it, besides seriously damaging other parts of the machine. Those who are interested in these experiments will find a brief *résumé* of them, written by Sir Hiram Maxim, in "Flight" of March, 1910. Although Sir Hiram was convinced of the practicability of his machine, he saw that he would have to abandon the steam plant on account of the amount of water required for a long flight. He therefore set to work to design an internal combustion engine, but a severe illness, followed by great pressure of work in connection with his many other inventions, led to the scheme being abandoned. In 1909 Sir Hiram Maxim built a new biplane, this time at Erith, and full details, with photographs and scale drawings of the completed machine, were given in "Flight" of April 30th, 1910.

In 1909 Sir Hiram Maxim published a little book, "Artificial and Natural Flight," which set forth the results of Sir Hiram's experiments to ascertain the relative effects produced by winds of known velocity upon objects of different shape, and also the resistance offered by similar shaped bodies passing through the air. Coming as it did at a time when there was not a great deal of literature available of a practical nature, this book, although the experiments were unfinished and the results unchecked, proved of great use to designers in the early days.

Sir Hiram Stevens Maxim had a frank, breezy nature, which won for him friends wherever he happened to be. Born at Sangerville, Maine, U.S.A., on February 5th, 1840, he started life as a coachbuilder, and tried his hand at various trades before coming to Europe in 1881. For the latter part of his life he made England his home, and, having been naturalised, he was knighted in 1901.

The funeral took place at Norwood Cemetery on November 28th, and among the mourners were Lady Maxim (widow), Master Maxim Joubert (grandson), the Hon. H. Fletcher Moulton (representing the Controller and the Munitions Inventions Department), Sir Trevor Dawson and Mr. V. C. Vickers (representing Messrs. Vickers, Ltd., of which firm Sir Hiram Maxim was for many years a director, its title then being Vickers, Sons and Maxim)

The late Sir Hiram S. Maxim, whose name is so well known throughout the world as an inventive genius. Sir Hiram is seen at the control gear of the aeroplane which he designed and built in 1910.



The biplane which was the conception of the late Sir Hiram S. Maxim, of how man should fly. This machine was built by him in 1910, and a full description of it appeared in "FLIGHT" of April 30th, 1910.

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The S.B.A.C. Still Growing.

Recent recruits to the ranks of the Society of British Aircraft Constructors include the following :—

Ordinary Members.—Peter Brotherhood, Ltd. ; Crossley Motors, Ltd. ; Hooper & Co., Ltd. ; Willans & Robinson, Ltd.

Associate Members.—Aeronautical Instrument Co., Ltd. ; Thos. Firth and Sons, Ltd. ; J. Glikstein and Son, Ltd. ; William Jessop and Son, Ltd. ; Swift, Levick and Sons ; S. Smith and Sons, Ltd. ; Alexander Stephen and Sons, Ltd.

ANSWERS TO CORRESPONDENTS

If in doubt about anything aviatic, write to " FLIGHT *" about it.*

H. B. (Bedford Park).

We have been unable to discover the exact date on which the first Clerget engine was brought out, but at any rate so far back as in October, 1910, there were exhibited at the Paris Aero Salon two Clerget engines, one a four-cylinder vertical water-cooled, rated, we believe at 50 h.p., and another, an 8-cylinder Vee water-cooled engine, rated at 200 h.p., which was at that date probably the most powerful engine yet produced for use on aeroplanes. Whether Clerget had brought out any aero engine previous to that time we do not know.

H. H. W. (Barrow-in-Furness).

We regret that we cannot find the particulars of the Weiss man-carrying glider for which you ask. The usual method of finding the lift coefficient of a wing section is to test a small scale model in a wind tunnel, measuring the forces acting on it at certain speeds. If, as your question appears to imply, it is desired to estimate the lift coefficient of an actual machine, this can be done if the speed, weight and area of the machine are known, but the result will not then represent the actual lift coefficient as generally understood to be monoplane values, but a value corresponding to the particular aspect ratio, gap, and stagger of the machine in question. When it is desired to determine the lift per square ft. of a certain wing section from model experiments, use is made of the formula Lift/sq. ft. $= C\rho v^2$, where C = the lift coefficient found by model experiment, ρ = density of the air, and v = the velocity of the machine. When v is in m.p.h. the value of ρ is 0·0051, and the equation becomes Lift/sq. ft. $= C \times 0{\cdot}0051 \times v^2$. If a given machine is known to fly at 60 m.p.h., and the loading is known to be 4 lbs./sq. ft., we can obviously substitute in the formula, so that we have $C = \frac{\text{Lift per sq. ft.}}{0{\cdot}0051 \times v^2} = \frac{4}{0{\cdot}0051 \times 60^2} = 0{\cdot}22$.

T. N. (Westminster).

The lift of a Zeppelin airship is always considerably in excess of the total weight when starting out on a journey, and when released by the crew that handle her, she would undoubtedly rise without any assistance from her engines provided there were no obstacles which had to be avoided in rising. A heavier-than-air machine is one which depends for its support on lifting surfaces moving at a certain velocity and deriving their lift from the motion through the air. Thus, for instance, an aeroplane is a heavier-than-air machine, since if the speed drops below a certain point it must inevitably come down. An airship, on the other hand, is a lighter-than-air machine, as it does not depend on its speed for lift, but can remain stationary without necessarily descending.

R. P. (Muswell Hill).

The letters L.V.G., A.E.G. and D.F.W., under which the respective German aeroplanes are known, are in each instance taken from the initial letters of the title of the firm that builds them. These are respectively: Luft-Verkehrs-Gesellschaft, Allgemeine-Elektricitäts-Gesellschaft, and Deutsche-Flugzeug-Werke. The object marked with a cross in the illustration of the L.V.G. which you enclosed, is the exhaust collector, which is designed to carry the exhaust gases up above the top wing, out of the way of the occupants. The number of revolutions of the engine are regulated by the throttle, which regulates the amount of gas drawn into the cylinders. The term "Tabloid" is sometimes applied to a very small machine, such as a Sopwith, Bristol, or Martinsyde scouting biplane.

F. W. (Acton).

The name "Spad" of the French machine is derived from the initial letters of the firm "Société Pour l'Aviation et Dérivés; and the "D" has not; as far as we are aware, any connection with Deperdussin. The full title of the firm is the Société Anonyme Spad pour l'Aviation et ses Dérivés.

W. W. (Eaton Square).

You would probably be able to get information from the High Commissioner. Most of the officers in the South African Flying Corps transferred to the R.F.C. and R.N.A.S. There are a great many difficulties in the way of flying in South Africa.

A. H. B. (Southwold).

You could not do better than study "The Aeroplane," by A. Fage, *6s. 6d.*; "Aero Engines," by G. A. Burls, 8*s.* 10*d.*; "Learning to Fly," by C. Grahame-White, 2*s.* 10*d.*; and "Aeroplane Design," by F. S. Barnwell, 2*s.* 10*d.* They can be obtained from "FLIGHT" office at the prices stated.

A. N. W. (Southampton).

Flying Officer is a grading in the Royal Flying Corps, while Flight Sub-Lieutenant is a rank in the Royal Naval Air Service. While on probation and learning to fly an R.N.A.S. officer is known as a Probationary Flight Officer.

A. C. C. (West Bridgford).

The possession of a R.Ae.C. certificate does not entitle you to a commission. Fees are about £125. It is impossible to say how long the training would take; it depends on the weather and the pupils' temperament. It might be rushed through in three weeks, or it might take three months.

J. P. R.

Apply to the Inventions Bureau of the Ministry of Munitions, 10, Princes Street, Westminster, S.W.

"Rolls-Royce" (Birkenhead).

Yes. Apply to Adastral House, E.C., for particulars. There would probably be no need for you to attest, as you would no doubt be simply transferred, if accepted.

"Marine Engineer."

Apply to the Admiralty for the necessary forms, and, having filled them up, send them to the Director of Air Services, Admiralty, S.W. Age limits, 18 to 23. No. The Admiralty will arrange for your training.

R. A. B. (Rock Ferry).

1. As arranged. 2. You should apply to Adastral House for these particulars. 3. The pay of officers in the R.F.C. was set out on p.

J. J. (Brooklands).

See reply to "Marine Engineer."

C. E. F. (Ashford).

You should write to the officer in charge R.F.C. Depôt. Farnborough. Shall be pleased to receive the photograph of the model.

R. F. W. (Leatherhead).

We can only suggest that you should inquire of the officer in charge R.F.C. Depôt, Farnborough. There is a good deal of drilling and marching to do.

J. C. B. (Woodford Green).

If you are accepted for a commission in the R.F.C. or the R.N.A.S., you will probably have the £75 refunded under certain conditions.

N. B. (Sale).

A Probationary Flight Officer receives 10*s.* a day plus 4*s.* a day for flying risk. When confirmed in rank as a Flight Sub-Lieutenant he will receive a further 4*s.* a day. All R.N.A.S. officers wear the eagle badge.

Seventeen (Forest Gate).

See reply to A. H. B. above. Whenever an opportunity offers, you should make a close study of the constructional details of any aeroplane which you can get near.

W. W. (Stratford-on-Avon).

The German airship brought down at Cuffley was the "L. 21," a large rigid airship of the Schütte-Lanz type. "L. 20" was wrecked off the Norwegian coast near Stavanger on May 3rd, 1916, while "L.19" was lost in the North Sea on February 3rd, 1916.

AWARDS FOR R.F.C. OFFICERS.

In as upplement to the *London Gazette* issued on November 23rd it was announced :—

The King has been graciously pleased to approve of the undermentioned honour and reward for distinguished service in the field, with effect from June 3rd, 1916 :—

To be Companion of the Distinguished Service Order.

Capt. (Temp. Lt.-Col.) W. R. Freeman, M.C., Manch. R and R.F.C.

In the list of honours announced in a special supplement to the *London Gazette* issued on November 26th it was stated :—

The undermentioned has been awarded a second Bar to his Distinguished Service Order for a subsequent act of conspicuous gallantry :—

2nd Lt. (Temp. Capt.) A. Ball, M.C., D.S.O., Notts and Derby R.

For conspicuous gallantry in action. He attacked three hostile machines and brought one down, displaying great courage and skill. He has brought down eight hostile machines in a short period, and has forced many others to land. (The Distinguished Service Order was awarded in *London Gazette* dated September 26th, 1916. First Bar was awarded in *London Gazette* dated September 26th, 1916.)

The undermentioned have been awarded a Bar to their Distinguished Service Order for subsequent acts of conspicuous gallantry :—

Capt. S. Grant-Dalton, D.S.O , Yorks R.

For conspicuous gallantry in action. He attacked two hostile aeroplanes, although quite unsupported. Later after being attacked by another enemy machine, and wounded in three places, he brought his machine back and landed safely. (The Distinguished Service Order was awarded in *London Gazette* dated July 27th, 1916.)

It was also stated that His Majesty the King has been graciously pleased to confer the Military Cross on the undermentioned officers and warrant officers in recognition of their gallantry and devotion to duty in the field :—

Lt. (Temp. Capt.) H. B. Davey, N. Staff. R.

For conspicuous gallantry in action. He led a reconnaissance of six machines with great courage and skill. Later, although attacked by 10 hostile machines, he continued to carry out this reconnaissance. He has previously done fine work.

Lt. (Temp. Capt.) F. H. Jenkins, R.F.C.

For conspicuous gallantry in action. He flew 150 miles at night and bombed an enemy aerodrome, descending to 500 ft. under heavy fire. He has throughout done excellent work in reconnaissance.

2nd Lt. (Temp. Capt.) T. Maxwell-Scott, R.F.C.

For conspicuous gallantry in action. He carried out artillery reconnaissances with great courage and determination. Later, diving to a low altitude, he attacked an enemy communication trench with his machine gun.

2nd Lt. (Temp. Capt.) S. W. Price, R.F.C.

For conspicuous gallantry in action. During a reconnaissance he was attacked by a large number of enemy machines. He manœuvred his machine with great skill, and fought down a hostile machine. On four previous occasions he and his pilot have accounted for enemy machines.

2nd Lt. L. H. Scott, Middlesex R.

He and his pilot pursued a hostile aeroplane for some six miles into the enemys' territory, and there shot it down. He has on many previous occasions done very fine work.

Lt. P. C. Sherren, Can. Inf.

He led a successful bomb raid, collecting and landing his formation with great skill. Later, he dropped bombs on an ammunition train from 500 ft., causing much damage.

2nd Lt. (Temp. Capt.) G. B. Ward, Gen. List.

He flew over the enemy's lines at a height of 1,000 ft. under heavy fire, and carried out a very successful artillery reconnaissance. He has previously done very fine work.

Temp. 2nd Lieut. T. J. West, R.F.C.

For conspicuous gallantry in action. He attacked an enemy machine and brought it down, displaying great courage and ability.

The following have been awarded a Bar to their Military Cross for subsequent acts of conspicuous gallantry :—

2nd Lt. A. S. C. Maclaren, M.C., K.O. Sco. Bord.

He attacked and brought down an enemy machine from a height of 5,000 ft. He has on many previous occasions done very fine work. (M.C. awarded in *London Gazette* dated July 27th, 1916.)

Lt. (Temp. Capt.) F. F. Minchin, M.C., P.P.C.L.I.

He flew 150 miles at night to bomb an enemy aerodrome, descending to 500 ft., and doing serious damage. On another occasion he landed 45 miles from our line to pick up the pilot of a damaged machine in a hostile country. (M.C. awarded in *London Gazette* dated May 31st, 1916.)

Lt. (Temp. Capt.) G. R. M. Reid, M.C., Arg. and Suthd. Highrs.

He with his observer pursued a hostile aeroplane for some six miles into the enemy's territory, and there shot it down. He has on many previous occasions done very fine work. (M.C. awarded in *London Gazette* dated June 24th, 1916.)

2nd Lt. (Temp. Capt.) A. M. Vaucour, M.C., R.F.A.

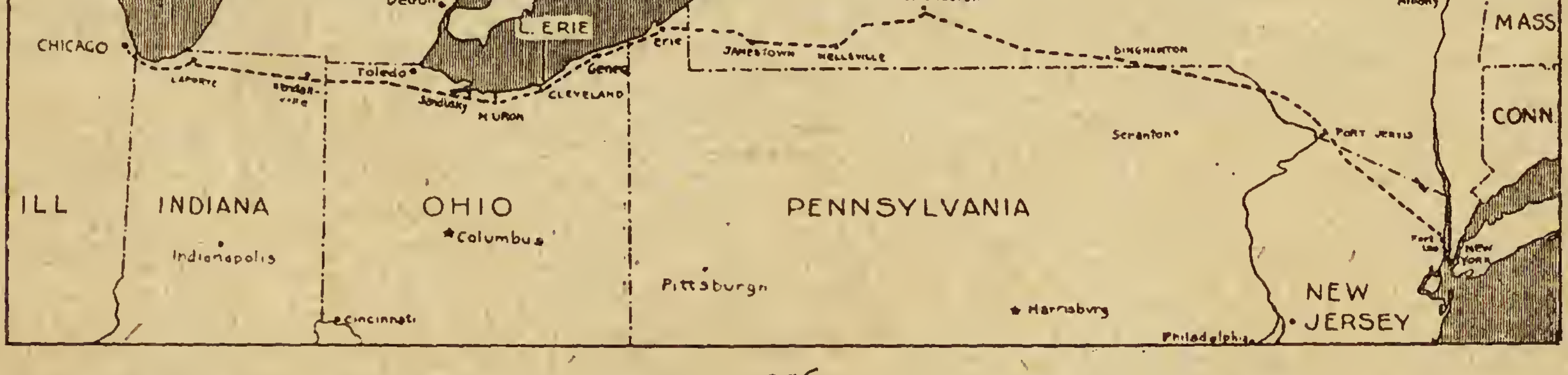
He attacked 10 hostile machines and completely scattered their formation. Previously, while returning with a perforated petrol tank, he shot down an enemy machine. Later, he shot down a hostile machine, being engaged with eight altogether. On another occasion he and his observer shot down two hostile machines. (M.C. awarded in *London Gazette* dated November 4th, 1915.)

◆ ◆ ◆ ◆

Victor Carlstrom's Chicago–New York Flight.

Some details are now to hand regarding the flight made on November 2nd and 3rd by Victor Carlstrom in a 200 h.p. Curtiss (J.N. twin) biplane from Chicago to New York. Leaving Chicago at 7h. 9m. 30s. a.m.; he made the 452 miles to Erie in 4 hrs. 17 mins. 30 secs., and then had just over three hours' rest. The 200 miles of the next stage to Hammondsport was completed in 1 hr. 50 mins. Leaving Hammondsport the next morning, the final 315 miles to Governor's Island occupied 2 hrs. 21 mins., the time of arrival being 8.56 a.m.

Carlstrom carried a bag of mails, which included a packet of post-cards to be sent by the submarine liner "Deutschland," among the addressees being the German Emperor, Field-Marshal von Hindenburg, Dr. von Bethmann-Hollweg, Herr von Jagow and the editors of the chief German newspapers.



AIRISMS FROM THE FOUR WINDS

Engines, Engines, Engines!

* * *

Engines larger and more powerful for our scouting squadrons are absolutely vital if we are to hold up our end against the German efforts to regain ascendancy from above. There is no time to lose, as the loss of even partial or temporary control must have a telling effect upon our efficiency in more directions than one. It is moreover only due to our splendid flying men that there should be no chance of their being handicapped for want of practical forethought. They will fight against any odds, but higher mechanical powers of navigation must and will tell in the end. So let there be no lagging in filling the requirements of the R.F.C. Already the Huns are getting their superior strafers into action. Shoals of them are likely to develop rapidly—only too rapidly, and a grave responsibility will rest with those at home if our side is not equipped speedily to meet the coming menace.

* * *

"Curfew shall ring to-night," is the revived motto of Wigan. Last Saturday night this ancient custom was reinstated as a modern convenience of our own times, as a warning for the subduing of lights

* * *

For keeping green the memory of the murderous distribution of bombs from the piratical airships of the Hun, no better method could be adopted than the wide distribution of "relics" from the strafed airships themselves. To this end the gift is to be welcomed of the Army Council to the Royal United Service Institution Museum, Whitehall, of two incendiary bombs which failed to explode, a burnt-out incendiary bomb, a naval cap of a German officer, and other relics of the visit of Zeppelins on September 3rd.

* * *

Opportunity will be afforded next month to follow some of the work of our aircraft in connection with the naval and military operations in different spheres of action. A series of films for cinema and other theatres has been completed, and will, in December, be produced by all those houses seeking the very latest in war doings.

In this very admirable series, which had a private "trial" run last week at the West End Cinema, the whole of the procedure of launching a seaplane from the aeroplane mother ship "Ark Royal," now out in the Ægean, is most convincingly reproduced. Following the departure from the decks, the audience will have the added advantage of accompanying the pilot in his flight, as a cinematographer upon this occasion occupied the observer's seat and obtained a running record of Mother Earth as she appears under such conditions. Away below are seen amongst other novel scenes the closely packed houses of the Greek villages. A trip is made in one of our "Blimps." The craft emerges from its shed, and the whole process of launching, &c., is witnessed on the screen. Then follow some vivid earth pictures, giving a slight idea of what shelling enemy trenches—in this case Bulgarian—means, the method of firing concealed guns, the transport of wounded, and, by way of contrast, the manipulation of our submarines and the working of the latest thing in submarine big guns. The new war films are likely to take on with some grip.

* * *

Mr. Lanchester's new book, "The Flying Machine from an Engineering Standpoint," which has been expected for some time, and has, owing to the shorthandedness in the publishing and printing trades, been unavoidably delayed, will be published by Messrs. Constable early in December.

* * *

Why is it so many of the military, who indirectly are part of most of the present restricting orders on public freedom of action, should be transgressors of the very regulations which are associated with war time operations? Time and again it is an officer in charge who ridicules the idea that his regiment should have to bother about exposed lights, &c. So again a section of the clergy still assert their claim to clang their bells after dark and be—well tommy-rotted to the administrators of the law. At least that is the way the Rev. E. Coulthard, vicar of Winchmore Hill, expressed his views to the local constable the other day when asked to stop the ringing of his peal of bells. These leaders should rather be the first

WINGED!—A French biplane shot down on the coast of Flanders.

to recognise the value of good example, and it would appear a bit paltry under the circumstances that the pugnacious vicar when actually confronted with the majesty of the law should attempt to shift the responsibility on to the shoulders of his churchwardens. But as the latter had forgotten their names and addresses, the constable contented himself with laying the blame on the vicar. Being a first offence, he just got a lecture, but it should serve as a warning for others like-minded.

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Short lectures three days a week, with aircraft and their part in the war as subject, should be fascinating for those associated with their construction. Already the effect has been, at the aeroplane factory where the course has been instituted, to help both efficiency and output. There is room for the example to be followed in other directions. It takes the workers away from being merely automata, without interest in the particular part allotted to them to make, once it has left their hands.

- - -

Georges Carpentier is the type of man that would be distinguished in whatever phase of life he graduated. As a boxer of the most telling nature he has gained the respect and admiration of Britons, and that, in this sport, is the world. In the war he scored from the first when he joined up with the French army, and in the French Air Service his winning of the Military Cross is long since known to our readers. By way of a rest last Sunday he returned to his old love, the ring, but with no idea of personal aggrandisement. It was just to do a good turn at the Paris Trocadero, with the aid of some other lesser French champions, to the fund for French wounded soldiers, brothers in arms, who had not been as fortunate as Carpentier in the hazards of war. His appearance was welcome, as it gave a chance to know that the champion was just as lively and as fit as ever.

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The Air Board powers discussion—duly muzzled—in Parliament is down for Tuesday next. The Air Board's report, however, is *taboo*.

TEN YEARS AGO.

*Excerpts from the "Auto." ("*Flight's*" precursor and sister journal) of December,* 1906. *"*Flight*" was founded in* 1908.

M. Santos Dumont and His Aeroplanes.

Not satisfied with the driving force at his disposal in the machine with which he had made the world-wide record, M. Santos Dumont is already arranging for a new machine with 100 h.p. Antoinette motor to be built, which it is calculated will only weigh 100 kilogs.

"La Patrie."

On the 22nd instant the great airship went out again, leaving the shed at 8 o'clock in the morning. The motor was started and tested up till ten minutes past nine, and then the airship was lead off on the guide rope to the usual starting point on the plain near Moisson. There were six passengers on board, including Lieut. Bois and MM. Juchmès and Rey. The airship was let go at 9.32, rose to a height of 80 metres—at which height it was in a position of equilibrium—and spent 30 minutes performing various evolutions under the pilotage of Lieut. Bois, who actually steered the airship for the first time.

M. Santos Dumont at Work.

M. Santos Dumont made another trial with his repaired aeroplane on Monday, numerous friends being present, but the motor unfortunately failed to give satisfaction, one of the cylinders not operating properly, and it had to be dismounted for examination. As soon as the engine is right M. Santos Dumont will make another trial, and from the look of things, we may hope that almost any day he may succeed in carrying off the Deutsch-Archdeacon Prize.

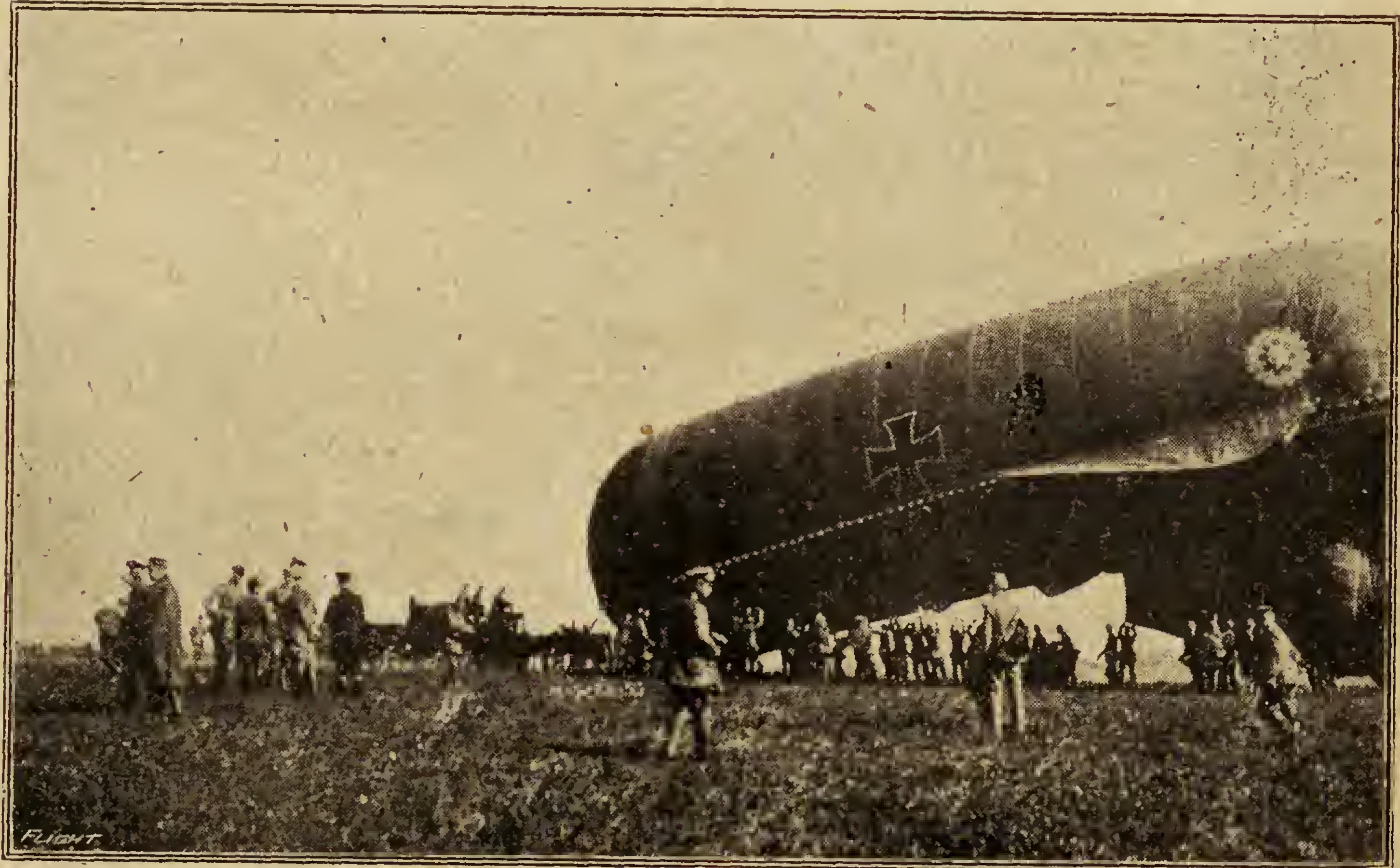
The Comte de la Vaulx's Machine.

The Comte de la Vaulx has also become converted to the aeroplane, and is devising, in conjunction with MM. Victor Tatin and Maurice Mallet, an aeroplane the general outline of which closely resembles a bird, that is to say, it has a wide outstretched aerocurve and a long rear projection, at the end of which are both vertical and horizontal tails.

The Vuia Aeroplane.

M. Vuia, who last year constructed an aeroplane of novel form has just been carrying out his experiments at Bagatelle, in the presence of M. Santos Dumont. The apparatus consists of a structure carrying a carbonic acid motor, which operates two immense wings. The weight of the whole is 280 kilos. For the purpose of increasing the speed M. Vuia has provided the front of the car with two propellers. We may add that in consequence of a slight accident the experiments had to be interrupted, but are shortly to be recommenced, when M. Vuia anticipates leaving the ground and travelling a greater distance than M. Santos Dumont has done.

Neutral war correspondents watching the sending up of a German kite balloon on the Somme front.



AVIATION IN PARLIAMENT.

Air Raid Insurance.

Sir Edward Beauchamp, in the House of Commons on November 21st, asked the Prime Minister whether his attention has been called by the War Damage Committee, which claims to represent 718 municipalities, with a population of over 28,000,000, to the unfairness of the present scheme of insurance against aircraft and bombardment, which imposes a burden upon citizens unequal in its incidence because determined by geographical situation; and whether the Government will reconsider the question, with a view to giving compensation to owners of property and goods that have already been, or may in future be, damaged or destroyed either by aircraft or bombardment?

Mr. Noel Buxton asked the Prime Minister whether he will consider the desirability of granting full compensation to owners of property damaged by aircraft and bombardment, in view of the unequal incidence of the existing system of insurance on different parts of the country?

The Prime Minister: The answer to the first part of Question 79 is in the affirmative. As I have already informed the House, the Government are considering whether any alteration is necessary in their policy as regards injuries and loss of life in this country due to enemy operations. But I see no reason to alter the scheme of insurance against material losses due to this cause, which I believe is generally regarded as adequate?

Sir E. Beauchamp: Cannot the right hon. gentleman accept the suggestion in its entirety, so that the additional premiums charged for loss and damage due to bombardment should be remitted and dispensed with, as this charge falls on those on the coast who have already suffered severely?

The Prime Minister: That is being considered, certainly.

Mr. Hogge: When will a decision be given as to awarding compensation in cases in which lives have been lost?

The Prime Minister: I cannot say. It is an urgent matter.

Mr. Billing: In the event of there being a change in Government policy, and this additional compensation being given, will it be given in the case of those who have lost their lives and property since the outbreak of war?

The Prime Minister: That is a hypothetical question to which I can only give a contingent answer.

The Air Board Report.

Mr. Ashley asked the Prime Minister whether he will give an early day for the discussion of the motion on the powers of the Air Board, standing in the name of several hon. members?

The Prime Minister: Yes, Sir; facilities will certainly be given for this discussion, but I cannot yet name an exact date.

Mr. Ashley: May we have this discussion before the decision of the War Committee and not afterwards, so that we may express an opinion on the subject?

The Prime Minister: I cannot promise that, but the House will certainly have a full opportunity of discussing it.

Mr. Billing: Have the naval branches of the Air Service been held up pending these constantly postponed decisions of the Government?

The Prime Minister: No, Sir.

The Royal Naval Air Service.

Mr. Joynson-Hicks, on November 22nd, asked the First Lord of the Admiralty what percentage of the personnel of the Royal Naval Air Service are pilots; what percentage are on service in Great Britain; and, of the latter, what percentage are of military age?

Dr. Macnamara: The percentage of trained pilots on the total personnel of the Royal Naval Air Service (officers and ratings) is 3·2; the percentage of pilots under training compared with the total personnel is 1·7, making a total of 4·9 per cent. on the total personnel of the Royal Naval Air Service. Of the trained pilots in the Royal Naval Air Service, 47·7 per cent. are serving abroad leaving 52·3 per cent. serving at home. All the latter are between the ages of 18 and 41, and include pilots for the "Lighter-than-Air" side and those employed on training and instructional work.

Transfers from R.N.A.S. to R.F.C.

Mr. Joynson-Hicks asked whether several officers of the Royal Naval Air Service have applied for transfers to the Royal Flying Corps; and why, as the latter corps needs pilots, the transfers have been refused?

Dr. Macnamara: As far as can be traced, three applications have recently been received from Royal Naval Air Service pilots to transfer to the Royal Flying Corps, two of whom wished to transfer as pilots and one as an observer. One of these officers was a trained airship pilot and the others were trained seaplane pilots. All were trained in types of aircraft peculiar to the Royal Naval Air Service, and it was considered they were doing better service in the Royal Naval Air Service, where their services were urgently required, than they would have done had they been transferred to the Royal Flying Corps.

Admiralty Aeroplane Contracts.

Mr. Joynson-Hicks asked the First Lord of the Admiralty (1) whether he is aware that in the early part of the war, one Lyman J. Seely, selling agent of an American aeroplane factory, informed his company that, through the influence in London of an English barrister, he would be able to get a large order for aeroplanes if he were allowed a commission of 15 per cent., as that was the usual rate for such business, in addition to the 1 per cent. which had up to that date been his previous rate for obtaining orders; and, if so, what steps he proposes to take; and (2) whether he is aware that in certain large orders placed in America for the supply of aeroplanes, there was added to the price a sum of 15 per cent., or one-sixth of the total order, amounting to some millions of dollars, for disbursements in England for securing the Admiralty order; whether various payments on account of these commissions have been made by the vendors to a certain English barrister; what precisely were the services rendered by him; whether the Admiralty has made any inquiry as to the origin and destination of this commission; and whether there was any necessity for paying a price to cover such a commission when the vendors were in direct communication with the Admiralty, and there was both a willing seller and a willing purchaser?

Dr. Macnamara We are informed that the gentlemen referred to represented the company in this country and were entitled to receive certain payments or commissions under the terms of the agreements between the company and themselves. The agreements, we learn, do not merely deal with agents' selling commissions, but with patent rights and other matters. During the course of an examination of accounts last July, it appeared that payment of commissions to agents to the extent of 16 per cent. of the contract price was being made. We objected and asked for explanations, and further inquiries are proceeding in the States. I should add that in the matter of our inquiries the company is giving us every assistance. I do not wish to prejudge the case one way or another, but it appears to be clear that the payments were made solely to the two persons referred to under the business agreements subsisting between them and their agents in this particular case.

Mr. Joynson-Hicks: Will the right hon. gentleman make inquiry whether these commissions were paid, as suggested in the question, for influencing business at the Admiralty? May we take it it is to be rigorously inquired into? If so, I will postpone any further questions for the present.

Dr. Macnamara: An inquiry is now being held into the accounts, in which the company is assisting. The point my hon. friend puts is certainly one which will be fully gone into; I will give him that assurance.

Mr. G. Faber: Can the right hon. gentleman say anything about the barrister mentioned in the first question?

Dr. Macnamara: Obviously that is a question which will arise on the inquiry I have promised.

Mr. Ashley: Does it not mean that if the Government enable the company to pay 16 per cent. to their agents they are paying too much for the aeroplanes?

Dr. Macnamara: I have said I am anxious not to prejudge the question. I do not think I ought to be called upon to answer questions in view of the promised inquiry. The House will have full opportunity of considering on the Report of the Public Accounts Committee.

Mr. Ashley: But that Committee will not know the facts for 18 months?

Mr. Joynson-Hicks: Might we not have a small Parliamentary Inquiry into Admiralty contracts, as to which there is a great deal of dissatisfaction?

Dr. Macnamara: I think we had better have the examination of the accounts first, and then I will put the other points to the First Lord.

Salvage Money for Zepp. Wreckers.

Colonel Lockwood asked the hon. member for Rugby, as the Parliamentary Representative of the Air Board, if, in view of officers of flying corps being forbidden to accept public money for services rendered in the air, the Government will consider the question of allowing salvage money for bringing down airships, in the same way as salvage money is now awarded for sinking ships of the enemy at sea?

Major Baird (*representing the Air Board*): I may refer my right hon. and gallant friend to the reply given by the Prime Minister to a similar question on the 8th instant. The proposal contained in his question involves considerations of military discipline and administration, and it is receiving the careful attention of the Departments concerned. I am afraid that I cannot say more at present?

Aeroplane Prices.

Mr. Joynson-Hicks asked the hon. member for Rugby, as the Parliamentary representative of the Air Board, whether he can give any figures showing the prices paid by the Royal Flying Corps and the Royal Naval Air Service respectively for the same aeroplane?

Major Baird: I regret that I cannot supply figures of the kind referred to. Variations of price for the same machine may well rise, among other causes, from the differences in the number of machines ordered and in the degree of urgency with which they are required. I can assure my hon. friend that this is a matter in which all possible measures are taken to secure co-operation between the two Services.

Air Raid Insurance.

Mr. Fell asked the President of the Board of Trade (1) if he can state the percentage of the amount of damage by air or sea raid of premises which have been insured compared with the premises damaged but not insured; and if a report on the working of the aircraft insurance scheme of the Government will be presented shortly; and (2) if the Government has a considerable sum of money in hand on account of the Government aircraft insurance scheme; and if it is proposed to reduce the rates for insurance in consequence in the near future?

Mr. Pretyman: It is not possible to estimate what percentage of the property damaged by hostile aircraft or bombardment was insured and what percentage was not insured, and I do not think the time has yet come for publishing the accounts of the Government aircraft insurance scheme. The question whether any alteration should be made in the rate of premium charged is under consideration.

Mr. Fell: Is it not possible to say whether the larger part of the premises destroyed or injured by these raids are insured or not?

Mr. Pretyman: We have the particulars of the insured premises which are injured, but not necessarily all the particulars of the non-insured premises.

Promotion in the Royal Flying Corps.

Mr. Joynson-Hicks, on November 23rd, asked the hon. member for Rugby, as the Parliamentary Representative of the Air Board, whether he is aware that officers joining the Royal Flying Corps lose their regimental promotion and that there is a considerable block in the promotion in the lower ranks of the Royal Flying Corps; and whether he can make a statement on the subject?

Mr. Forster: The only officers who can be said to lose their regimental promotion on joining the Royal Flying Corps are those of the New Armies. These officers leave their regiments on joining the Royal Flying Corps and are placed on the General List. There is no block of promotion in the lower ranks of the Royal Flying Corps; promotion, on the contrary, is very rapid.

Personals

Casualties.

Second Lieutenant Thurstan Francis Bassett-Smith, R.F.C., aged 19 years, who died in hospital on November 23rd from wounds, was the eldest son of Mary and Walter Bassett-Smith.

Lieutenant Eynon George Arthur Bowen, R.G.A. and R.F.C., reported missing on September 8th, since reported died the same day, was the son of the late Eynon George Rice Bowen, of Troedyranr, Newcastle-Emlyn, and Mrs. Bowen, of Hambrook, Bristol. Born in 1893, he was educated at Braidlea, Stoke Bishop, and was a scholar at Sherborne. He entered Woolwich in January, 1912, and was gazetted to the R.G.A. in December, 1913. He went to the front with a heavy battery in June, 1915, and in August became an observer, R.F.C. He passed as a pilot in May, 1916, and returned to the front.

Lieutenant Alfred Vernon Oliver-Jones, R.F.A., attached R.F.C., who was reported missing and now officially reported killed on July 21st, was the elder son of the late William Oliver-Jones, nephew and adopted son of Mr. Alfred Taylor-Jones, of Wybourne Grange, Tunbridge Wells. He obtained a commission in the R.F.A. in October, 1914, and went to the front on February 4th, 1915. He was seriously wounded at the battle of Neuve Chapelle on July 9th, 1915. He subsequently joined the R.F.C., and became a qualified observer on March 11th last.

Sub-Lieut. Cedric Lee, R.N.V.R., reported killed in action, will be remembered as the designer of the curious monoplane with annular-shaped plane with which he experimented at Shoreham in 1913 and 1914, it being piloted by Mr. Gordon England and Mr. Gordon Bell. Mr. Cedric Lee intended flying a machine of this type in the Gordon-Bennett race of 1914, but the war caused the abandonment of the project. On the outbreak of war Mr. Cedric Lee joined the ranks of the Royal Naval Division, and recently was given a commission. He was the younger son of Mr. and Mrs. Harold Lee, of Fairfield, Broughton Park, Manchester, and was 34 years of age.

Wounded.

Lieutenant Arthur V. Shewell, Gloucestershire Regiment, attached R.F.C., who has been wounded in a fight with enemy aeroplanes, is the elder son of the late Major Arthur Shewell, of the Indian Army, and grandson of the late Major-General Shewell, of Cheltenham.

Missing.

Lieutenant Norman Middlebrook, son of Mr. E. H. Middlebrook, a well-known Leeds solicitor, and nephew of Sir William Middlebrook, M.P., who has been missing for some weeks, has sent a postcard in which he says he is a prisoner. A student at Repton when war broke out, he was given a commission in the Rifle Brigade. Later he was transferred to the R.F.C. He is 19 years of age.

Married and to be Married.

The marriage of Mr. Rockingham Gill, R.A. and R.F.C., and Miss Christina Court Treatt will take place at St. Cuthbert's Church, Philbeach Gardens, S.W., at 2,30 p.m., on Saturday, December 2nd, not on December 9th as first announced.

The marriage took place last week between Lieutenant A. M. Walters, R.F.C., eldest son of Arthur M. Walters, Holmwood, Surrey, and Sybil, younger daughter of the late Mr. H. S. Everett and Mrs. Everett, Boston, Mass., U.S.A.

Items.

The will of the Hon. Henry Allen Rolls, of Tower House, Bletchingley, second son of the 1st Lord Llangattock, and elder brother of the Hon. Charles Rolls, has been sworn at £55,102.

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More British Flyers in Roumania.

According to a message issued by Reuter, further British aeroplanes and pilots have reached Bucharest, after very long flights, to join the British aircraft already in Roumania, and to reinforce the British and French aerial forces now operating with the Roumanian army.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, November 21st, 9 p.m.

"Yesterday our aeroplanes co-operated successfully with our artillery. Two of our machines are missing."

General Headquarters, November 22nd, 9.25 p.m.

"During the night of the 20th–21st our aeroplanes attacked enemy railway stations, billets and transports with bombs and machine-gun fire. All our machines returned safely."

Admiralty, November 23rd.

"During the course of yesterday afternoon (22nd inst.) an attack was carried out by British naval aeroplanes on the seaplane sheds at Zeebrugge and on the enemy's torpedo-boat destroyers lying alongside the mole. Observers state that a destroyer was hit and damage was done to the sheds. All our machines returned safely."

[*A French official* communiqué *stated that 34 bombs were dropped.*]

General Headquarters, November 23rd, 9.45 p.m.

"Yesterday the enemy showed considerable enterprise in the air, and crossed our line. Three of his aeroplanes fell into our hands, while a fourth was driven down on his own side of the line. One of our machines is missing."

War Office, November 24th.

"*Salonica.*—On the Doiran front British aeroplanes successfully bombed and damaged the enemy lines."

General Headquarters, November 24th.

"The weather continues stormy. Yesterday, in spite of unfavourable conditions, our aircraft made reconnaissances and co-operated with the artillery. One of our machines has not returned."

General Headquarters, November 24th, 9.45 p.m.

"Yesterday much successful work was accomplished by our aircraft. Twelve of our machines encountered an enemy formation of 20 aeroplanes, and as a result of the fight the hostile formation dispersed. One of the enemy machines was destroyed, and several others driven down damaged. All our own machines returned safely. In other fights in the air four of the enemy's aeroplanes were destroyed. Three of our machines are missing."

War Office, November 26th.

"*Salonica.*—On the Struma front our aeroplanes successfully bombed the enemy aerodrome at Drama."

General Headquarters, November 27th, 10.10 p.m.

"Yesterday, in spite of the indifferent weather, our aeroplanes co-operated successfully with our artillery, and also bombed several points of military importance. Two of our machines are missing."

French. *Paris, November 21st.*

"Last night our bombarding aeroplanes dropped 100 bombs on the enemy bivouacs behind the Somme front."

Paris, November 23rd.

"Second Lieut. Guynemer brought down during the day his twenty-second German machine. The enemy aeroplane came crashing to the ground near St. Christ (region of the Somme). Our bombarding aeroplanes yesterday dropped many bombs on the railway stations and bivouacs of the enemy on the Somme front.

"*Salonica.*—Our aeroplanes bombarded enemy encampments in the Topolani and Prilep regions. In the course of an aerial fight one of our aeroplanes brought down two enemy machines in the Drama district."

Paris, November 24th.

"Yesterday in Lorraine three British aeroplanes fought an engagement with several German machines. One enemy machine was brought down in the forest of Gremecey.

"On the same day on the Somme front our aviators fought about forty engagements, in the course of which five machines were brought down. Sergt. Flachaire brought down his sixth machine near Manancon, and Lieut. Doullin his tenth south of Vaux Wood.

"It is confirmed that on November 22nd Second Lieut. Guynemer brought down a second enemy machine in the region of Falvy. This brings the number of aeroplanes brought down by this pilot to 23. Six of our machines dropped 15 bombs of 120 mm. on Bruyères. Another of our air squadrons carried out a bombardment of the aerodrome of Griselles. Between 3.45 p.m. and 7 p.m. 171 bombs of 120 mm. were dropped. Last night, between 9.30 p.m. and 1.10 a.m., four of our machines bombarded the blast furnaces and factories of Voelklingen (on the Sarre). During this expedition 12 bombs of 120 mm. and 12 of 155 mm. were dropped, and appear to have been well placed. Our machines returned unharmed.

"Yesterday afternoon a German aeroplane was brought down by the fire of our anti-aircraft guns. The machine fell to the north of Berry-au-Bac. The same day Sergt.-Major Viallet brought down his sixth German machine near Moislains, in the Somme region."

Paris, November 25th.

"Yesterday, between 11 a.m. and 1 p.m., a group of aeroplanes of the British Naval Air Service bombarded the blast furnaces of Dillingen (in the region of the Saar). During this expedition a ton of explosives was dropped. Most of the projectiles struck their mark. An enemy aeroplane was brought down during the return journey."

Paris, November 26th.

"*Salonica.*—British aeroplanes bombarded the enemy camps in the region of Neohori, at the mouth of the Struma."

Paris, November 27th.

"A group of our aeroplanes last night bombarded the aerodromes of Guizancourt and Matigny. The projectiles successfully struck their objectives."

Russian. *Petrograd, November 24th.*

"In the region of the little hamlet of Verb, north of Romontz, an Austrian aeroplane was compelled to descend and the airmen were taken prisoners.

"On the River Bistritza our airmen successfully threw bombs on the enemy's artillery depôt in the villlage of Pavoltcho, on the railway north-west of Stanislavov. Our scouts made a series of successful reconnaissances in the region Kosmatch and Poroge, north-west of Zolotvin."

Petrograd, November 26th.

"Near Prudy Station, north-west of Molodcheno, a German aeroplane was brought down by our machine-gun fire. The occupants, an officer and a private, were taken prisoners.

"On the River Stokhod, near the village of Vulkaporskaia, an enemy aeroplane, which was hit by us near the village of Pojarki, north of Rovice, fell to earth. The wings of the machine were burnt. The aviators were taken prisoners.

"West of Novo-Oleksinietz the enemy is violently bombarding our positions. Enemy aeroplanes also flew over our positions. One of these, being attacked by our aviator, Capt. Vaftalovsky, was hit after a fight lasting a minute, and landed in the region of Rudnaia-Pochaievskaia Station. The machine was undamaged, and found to possess two machine guns. The aviator and observer were taken prisoners."

Italian. *Rome, November 24th.*

"Hostile aircraft dropped bombs on Agnede Grigno and Primolano, in the Suagana Valley, wounding two people, but were driven off by our aeroplanes, which rose in pursuit."

Rome, November 26th.

"Hostile aircraft attempted to make raids on several localities in the theatre of operations, but were driven off by fire of our anti-aircraft guns and by our aviators.

"An enemy air squadron, which had succeeded in dropping bombs on Tolmezzo without doing any damage, was attacked and dispersed by aircraft, and an enemy aeroplane was destroyed, one of the aviators being killed and the other taken prisoner. As the result of an air fight near Bilia, south-east of Gorizia, another enemy aeroplane was shot down."

Roumanian. *Bucharest, November 15th.*

"During the last two or three days the enemy has again displayed particular activity. Enemy machines have flown over Turna-Magurele, Zimnicea, the region of Giurgiuvo, Tulcea, Campolung, Sinaia, and Roman, and dropped bombs, causing slight damage. They dropped bombs on the capital and its environs, killing and wounding peaceable inhabitants, especially women and children. On this occasion they dropped a great number of bombs over the Palace, where the Queen and the Princesses of Roumania were formerly living.

Fortunately they had left after the death of Prince Mircea. On various occasions, and especially yesterday, enemy aviators flew over small towns and villages, descending very low with their machines, and fired with machine guns on the peaceable population in the streets or working in the fields."

Bucharest, November 21st.

"Yesterday the enemy again displayed aerial activity by bombarding the capital five times, killing and wounding several persons, especially women and children."

Bucharest, November 24th.

"Between Calafat Tjiu we captured an enemy aeroplane."

German. *Berlin, November 15th.*

"*Balkans.*—Bombs have been dropped by our airmen on the fortress of Bucharest."

Berlin, November 16th.

"Thirty-nine Belgians were the victims of an enemy air raid on Ostend.

"During the past few days, as retaliation for dropping of bombs on peaceful villages in Lorraine, Nancy has been shelled from the ground and bombed from the air."

Berlin, November 17th.

"Both during the day and by night aerial activity was lively on both sides.

"At 1 o'clock this afternoon an airman appeared over Munich and dropped seven bombs, causing only slight material damage, and no casualties. The airman disappeared in a westerly direction."

Berlin, November 19th.

"Last Thursday night German naval aeroplanes dropped a number of bombs, mostly of heavy weight, and of a total weight of over 1,400 kilogrammes (about a ton and a-half) with successful results on the town of Furnes (south of Nieuport) and on the flying ground at Coxyde (north of Furnes). At Furnes several conflagrations were observed. One aeroplane, by machine-gun fire, rendered two searchlights unworkable near Coxyde."

Berlin, November 21st.

"Our air squadrons dropped bombs on communication establishments near Bucharest."

Austrian. *Vienna, November 24th.*

"*Front of Prince Leopold of Bavaria.*—One of our airmen, Lieut. Popelak, while on a reconnoitring flight north of Brody, was attacked by three Russian battle-aeroplanes. He forced them to take to flight, and drove them crashing to the ground behind their own lines."

Bulgarian. *Sofia, November 21st.*

"Our artillery brought down an enemy aeroplane, which fell in the Vardar Valley. We took prisoners the two occupants.

"On the Ægean Coast there is a lull. Enemy aeroplanes dropped bombs on our positions near Orphano and the bridge near Buk, but obtained no result."

FROM THE BRITISH FLYING GROUNDS.

Bournemouth School.

PUPILS rolling alone last week: Messrs. Fisher and Vivian. Straights alone: Messrs. Hall, Peat, Vermorel, Ross and Vivian. Half circuits alone: Mr. Allen. Circuits and eights: Messrs. Burry and Holland.

Instructors: Messrs. E. Brynildsen and H. Smith.

Certificates taken during the week by Messrs. Burry and Holland.

A large crowd, including a great number of soldiers, visited the Bournemouth aerodrome on Wednesday afternoon and witnessed some very fine flights by Mr. Brynildsen, whose well-judged bankings and daring nose-dives with a passenger were most interesting. Later in the afternoon Mr. H. Smith made a couple of very good flights on the 45 Caudron.

Carlstrom Secures the Curtiss Marine Trophy.

AT the close of the 1916 competition for the Curtiss Marine Trophy and $1,000 cash prize on October 31st, the leading performance was that of Victor Carlstrom, and he has now been awarded the prize. The winning flight was made on August 28th, when, on a J.N. twin Curtiss seaplane, Carlstrom flew 614 miles in 8 hrs. 41 mins. over a 51-mile circuit from Newport News to Fisherman's Island, near Cape Charles.

PUBLICATION RECEIVED.

Aircraft. By "An Air-Pilot." London: George Newnes, Ltd. Price, 2s. 6d. net.

SIDE-WINDS.

OVER £1,065 has already been received by the Society of Motor Manufacturers and Traders in connection with the President's appeal for the Union Jack Club. Among the contributions are £50 each from the Austin Motor Co.; Dunlop Rubber Co., Ltd.; Daimler Co., Ltd.; Wolseley Motors, Ltd. £25 each from Brown Brothers, Ltd.; Rudge-Whitworth, Ltd. £5 5s. each R. W. Coan; J. Glikstein and Son, Ltd.; H. M. Hobson, Ltd.; Simms Motor Units, &c.

* * *

OIL and grease from aero engines is not easy to remove from the hands with ordinary soap, and a welcome will therefore be extended to "Duco" hand cleaner, a preparation of pumice and soap, which Messrs. Brown Brothers, Great Eastern Street, E.C., are introducing. Not only does it remove grease and oil very quickly and efficaciously, but stains, &c., also disapppear by its use, and withal the skin of the hands is not injuriously affected. The "Duco" hand cleaner, which is a British-made composition, is sold at 6½d. per lb., and is put up in a handy tin.

* * *

THOSE who are using the American type E.M. Eisemann magneto should note that Mr. Stanley J. Watson, of Berners Works, 37 Sheen Road, Richmond, S.W., has just produced a price list of spare parts. It is illustrated by detailed photographs of the various parts, every one of which is clearly numbered, while the list also gives the correct designation for each individual part. With the aid of the list it should therefore be impossible for any misunderstanding to arise when ordering spare parts, especially if the simple directions set out on the first page are closely followed.

* * *

BY the time these notes are in print the London Sheet Metal Working and Welding Co., perhaps better known by their euphonious Az-Nu mark, should be completely installed in the new Az-Nu works at 261, Church Road, Mitcham, S.W. They are much larger than the old premises, and altogether better equipped in every way for radiator lamp, tank and welding work, both new and repair, as well as sheet metal work of every sort.

* * *

FROM the headquarters of the Shell Marketing Co., Empire House, Kingsway, W.C., comes a booklet which, besides explaining the reason for the temporary withdrawal of Shell No. 1, as recently mentioned in "FLIGHT," sets forth clearly the position with regard to the distribution of Shell and Crown spirit from January 1st next, when it will be entirely in the hands of the Shell Marketing Co., Ltd., the new company established and controlled by the proprietors of Shell spirit. Emphasis is laid on the fact that all purchases of Shell and Crown motor spirit for 1917 can be negotiated only with the Shell Marketing Co., Ltd., and that they alone can supply "Shell" products after December 31st, 1916.

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week.

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NOTICE.—Next week's issue of "FLIGHT" (December 14th) will contain a Christmas Greeting Section in Two Colours. Orders should be placed early to ensure obtaining copies.

EDITORIAL COMMENT.

The Changes at the Admiralty.

WITH the advent of Sir John Jellicoe to the Admiralty as First Sea Lord, it is permissible to hope that there may be a change for the better in Admiralty policy in regard to the Air Service. It is true that the constitution of the Board lays down that the duty of the First Sea Lord is : "In all matters of strategy : to advise," and that, therefore, he has directly very little to do with the administrative functions of the Air Department. But the all-round efficiency of every department has so great a bearing on the strategy of war, that it is very much the concern of the First Sea Lord to know that everything which makes for that efficiency is in smooth working order and to insist upon change in any or all directions in which there is friction.

After nearly 2½ years in command of the Grand Fleet, Sir John Jellicoe is in the position of knowing exactly what is wanted to maintain our naval supremacy, and that he will insist upon all the essentials being forthcoming we need not doubt for an instant. So far as concerns the Air Service, it is doubly fortunate that Sir John has been appointed. Not only does he know at first hand the exact bearing on sea power of air policy as a result of his work afloat, but he returns to the Admiralty also fortified by administrative experience of the Air Department itself. Prior to the war, and when Sir John was Second Sea Lord, it was he who was responsible to the Board for the development of the Air Service, and it was under his advice that it grew from nucleus form to the comparatively established service it had become at the outbreak of war. He will thus be in an excellent position to judge of the controversies which have led to the present state of deadlock which exists between the Admiralty and the Air Board, and we doubt not his ripe experience and his knowledge of the necessities of the situation will be brought to bear on this as well as on other problems of Naval administration which are crying aloud for settlement.

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The Cabinet Crisis and the Air.

In the ordinary course of events the question of relations between the Air Board and the fighting services was to have been debated in the House of Commons on Tuesday this week. We had fully expected that the most important conclusions would have been arrived at as a consequence of a thorough discussion of the differences and that a very long step would have been taken towards their composition. In the light of the long over-due Cabinet crisis which came to a head during the week-end and the re-shuffling of the cards which will inevitably result from it, there has been inevitably a further postponement of the looked-for debate. Indeed, circumstances may well arise to render public discussion unnecessary.

Writing as we are compelled to do early in the week, it is a matter of considerable difficulty to arrive at any fixed conclusion as to the exact turn events are likely to take. The facts as we know them at present are that the War Council is to be strengthened by the scrapping of some of the less virile of its members and by the inclusion of others who will, we trust, bring to bear a wider outlook and more of the spirit of forcefulness than has been manifested by the old Council. Had that spirit been more marked, the necessity for the public discussion of our weaknesses would in all probability never have arisen. What the nation needed was a War Council which could make up its collective mind to act, and that is what we have not had. Let us take this matter of the Admiralty-Air Board controversy as a case in point. We have on the one side a Board which takes the point of view that a certain course is the only one to be adopted if we are to make the most of our resources for the business of winning the war. On the other, we have one of the fighting Services which differs from the Board on the fundamentals of how those resources can be used to the best advantage. Both Admiralty and Air Board are sincere in the point of view—it would be absolutely and entirely out of the question to argue otherwise. Therefore, we are reduced to this: that there is a conflict of opinion in which one side or the other is right, and until that conflict has been adjusted the nation cannot be satisfied that everybody is doing his best to shorten and to win the war.

Now, we have a War Council whose business it is —or ought to be—to compose such differences. It has the power, under the Cabinet, to say to one or other of the parties to the dispute: "You are to do this or that," and that party must either carry out its orders or give place to someone else who will. But that is exactly where the War Council as it is at present constituted—or was at the beginning of the week—has failed. It has allowed this and other matters to drag on week after week and month after month, what time the enemy is straining every nerve and every resource to pass us in preparations for next year's campaigns. It has proved itself a body as spineless as a jellyfish. It has worked on the principle of never doing to-day what can be put off until the morrow. In the middle of the greatest war of all time it has consistenly and invariably failed to do anything until it has been kicked into action by sheer force of public opinion. It has failed utterly to realise that the nation expects to be led and not followed, and that what the country demands is a body which will "Act," and not a mere debating society which does nothing but adjourn its discussions.

We are entirely against Cabinet-making by the newspaper Press at a time like this. The agitation which has for its text that somebody "Must Go" savours too much of the old Party game to be accepted by the plain, thinking citizen who has no concern but that of getting on with the business of the war. Wrecking for wrecking's sake is the worst of all possible remedies, because of its reactions on all parties. If we are to have our Cabinets made in Fleet Street, and if Governments and individuals are to fall at the caprice of editors, then good-bye to all our hopes of victory. We are all for keeping the Government of the day up to the mark, as we are all for ruthlessly scrapping those who have for any reason at all failed the country in its hour of need. But there is a difference. There are some members of the present Government who most certainly do not possess the confidence of the country, yet they are being kept in their several offices because—well, it passes our comprehension to know why. There are others in whom the country has unbounded confidence. That being so, we are in full accord with those who are clamouring for the dismissal of the one lot and the retention of the others, but we do think that the Press agitation has gone too far in certain quarters. It is no part of the duty of the Press to impose its own policy on a Government which is manifestly in a better position to judge of policy than its critics. So far as we are able to discern, it is not that the *policy* of the Government is wrong, but that that policy is not pursued with the requisite strength and determination. Again, let us revert to the matter of the Air Board for an illustration of this. The policy that dictated the formation of the Board was altogether admirable. At the time it was formed we believed that it was really to be armed with the powers necessary to put our Air Services on the best possible footing. Performance was weak, despite the fact that policy was sound. The result was the fiasco we have seen. By all means, then, let us get rid of the bureaucrats who are so jealous of departmental "rights" that they apparently put them before even victory, but let us be careful that we do not exchange the rule of King Log for that of King Stork.

If the result of the present crisis is to give us a real War Council with sufficient moral backbone to decide things as they arise and to enforce its decisions—and such a War Council can be formed without much difficulty—it may well be that we shall be saved the unedifying spectacle of the Parliament of the greatest Empire on earth discussing the question of whether the Admiralty or the Air Board is the real friend. We have advocated this discussion, because we felt that unless it took place nothing would be done. The necessity for such a deplorable exhibition of weakness we have deprecated. Now we have hope that it will not be necessary after all. If out of the crisis emerges a War Council which inspires the nation with confidence, and if the assurance is forthcoming that one of the first things with which that Council will concern itself is the matter of our aerial supremacy, then we are quite content to leave the question to the Council in the meantime. But in return for its confidence the nation will ask for ACTION, prompt and far-reaching.

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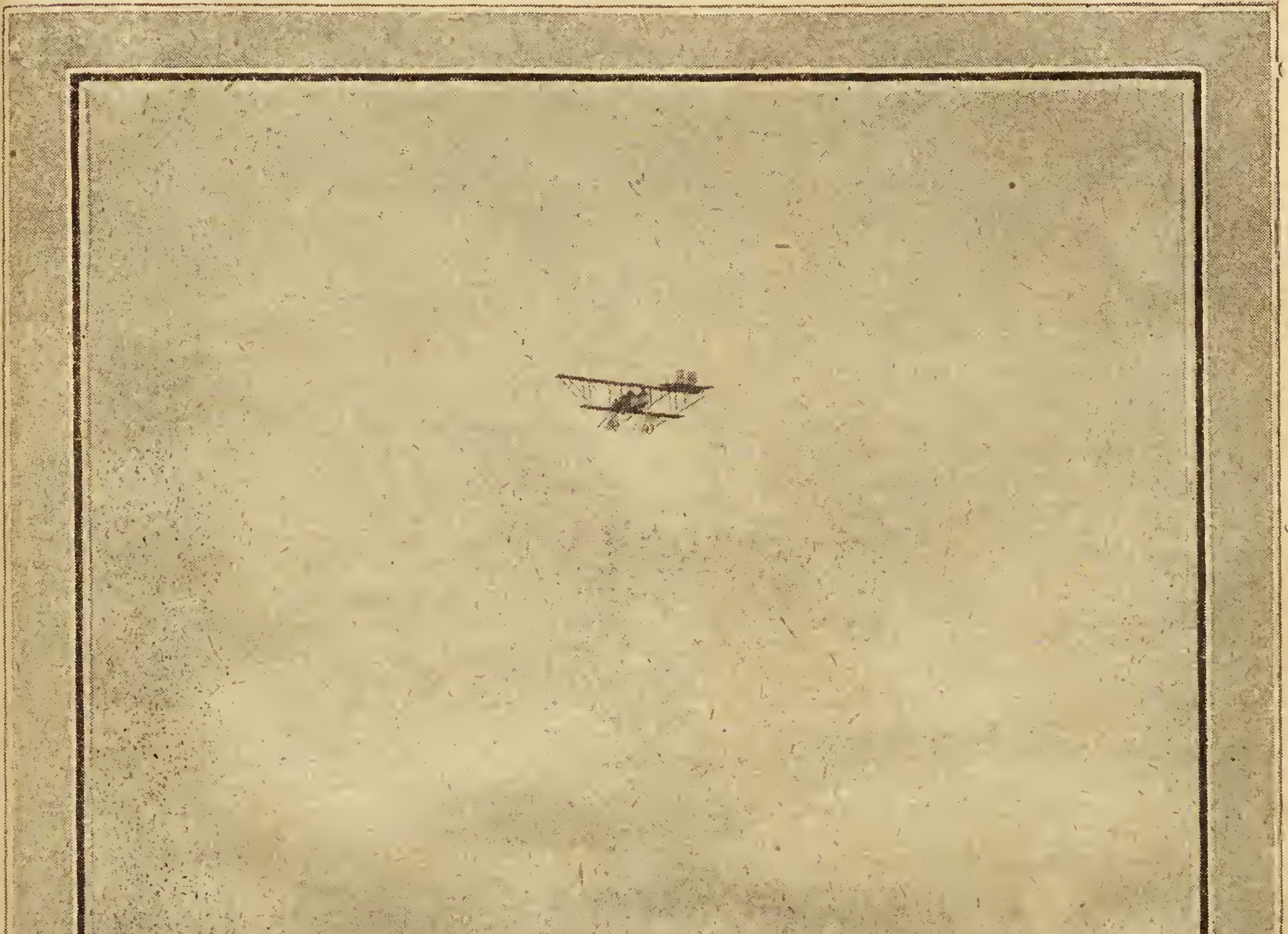
"Prepare for 1917."

Once again we are impelled to return to the subject of the supreme importance of preparing for the efforts the enemy is sure to make next Spring to wrest from us the mastery of the air on the Western front. We have said "next Spring," but we ought really to write in the present tense, and say that we must strain every nerve to meet the efforts the Germans are putting forth even now. For example, in the *Times* the other day was published, as if in corroboration of our comments last week, an extract from a letter written by an officer at the front, in which the writer says: "I saw a pretty good air



REMINISCENCES OF HENDON.—René Desoutter on a Caudron.

fight the other day, and Fritz had us beat to the wide. His machines were twice as fast as ours."

We are neither alarmist nor pessimist, but we have been hearing too much of the same sort of thing lately. It is in the nature of things that in a war of the magnitude of the present struggle there will occur numberless cases in which one side or the other is in possession of a local superiority in men or materials. That being so, it must sometimes be the case that the obsolescent British machine will find itself up against a more modern and therefore more efficient enemy aeroplane, and conversely. But when that sort of thing occurs with something approaching regularity it becomes disquieting, and we are led to ask if all is as well as we are asked to believe, and whether we are in fact doing all that the situation demands? In particular are we concentrating enough on the provision of squadrons of fast scouts, machines that will beat the latest German types—or at least equal them—in speed and climbing capacity? It is absolutely vital to the success of our aerial operations that such machines shall be provided, and that without delay, as an answer to the Roland and Halberstadt machines that the enemy is now putting into the air on the Somme front, and of whose wonderful speed and climbing powers we hear a great deal. They must be answered in kind—we have the means—and to make the answer effective entails that we shall have to concentrate our energies on the output of engines—big engines of a power and type that will put the speed and climbing capacity necessary to meet offensive with offensive into the hands of our airmen at the front. We have the best airmen in the world—airmen who to maintain our mastery of the air will go up and take chances in meeting the superior German machines, but we ask: Is it right that our pilots should be asked to take these chances? The question does not require answering. It most certainly is not right that we should depend for our supremacy on the superior skill and the greater daring of our personnel. That we are able to maintain it is a wonderful tribute to the gallantry and self-sacrifice of the R.F.C., especially when we are cognisant of the handicap imposed upon them by the large numbers of obsolescent machines that are in use at the front. We know that it is impossible that these can be replaced in the twinkling of an eye. Further, we know that efforts are in fact being made to keep our material in front of that of the enemy, but we are by no means satisfied that *everything possible* is being done in that direction. That is in great part due to the existing unsatisfactory state of affairs as regards the Air Board, a matter that we have dealt with elsewhere. We have indicated the remedy—more and yet more squadrons of fast, powerful scouts. That is what we have to go for, or we shall stand in grave danger of losing that complete mastery of the air which we hold at present. Indeed, we would put the matter in a stronger light, and say that we are even now in danger of weakening in our hold, and that only by the most whole-hearted effort on our part can we maintain our full hold. We can build the machines; the crux is engines. That seems to be the critical point on which our efforts must be still further concentrated.

* * *

The Raid on London. There was nothing surprising in last week's aeroplane raid on London, except that it came so late in the war. It was only what was to be expected and what was very long overdue. Why no enterprising enemy airman had not taken his fortune in his hands many months ago we do not profess to understand. Fortunately, the experience of last week's raider is not one to encourage the others, else we should have committed ourselves to the prophecy that as this was the first, so it would not be the last. As it happened no particular damage was done, and the raider was intercepted and brought down before he could reach the friendly shelter of his base. Such an experience will probably give the Germans to ponder, although at the same time it would be the rankest folly on our part to assume that for the future we are likely to be immune from such spasmodic raids. On the contrary, they are very likely to recur—and not with single machines—from time to time, and it is for us to consider the best means of guarding against them.

To our way of thinking, the best defence against these raids lies in carrying the war into the enemy's country. Let the Germans be given to understand that every such raid will be countered by two raids on open enemy towns for every one carried out on this country. We held aloof from the policy of reprisal as long as it was possible to do so, but we are now convinced that it is the only possible one to employ against such an enemy as we are engaged with now. It is the only argument he can understand, and the sooner we revert to the Mosaic code of an eye for an eye and a tooth for a tooth, the sooner will the German mind grasp the fact that "frightfulness" is a two-edged tool that is apt to cut the one who employs it. As long as we refrain from reprisals, the enemy will continue to believe—as he undoubtedly does—that we have not the means at our disposal to hit him where he lives, or that if we have the means we are afraid to employ it. Let us show him that neither of these theories is correct, and these raids will cease at once. Refrain, and we shall never be safe from them.

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Honours for Zepp. Strafers.

The following was announced by the Secretary of the Admiralty on December 3rd:—

"The King has been pleased to approve the award of the Distinguished Service Order to Flight Sub-Lieutenant Edward L. Pulling, R.N.A.S., and of the Distinguished Service Cross to Flight Lieutenant Egbert Cadbury and Flight Sub-Lieutenant Gerrard W. R. Fane, of the R.N.A.S., in recognition of their distinguished services on the occasion of the destruction of a Zeppelin airship off the Norfolk coast, in early morning of Tuesday, Nov. 28th, 1916."

In the *London Gazette* of December 6th the award of the D.S.O. to Flight Sub-Lieut. Pulling is given as follows:—

"In recognition of the skill and gallantry which he displayed on the morning of the 28th of November, 1916, in pursuing out to sea, attacking at close range, and destroying a Zeppelin, which had been engaged in a raid on England. Flight Sub-Lieutenant Pulling was exposed to machine-gun fire throughout the attack."

The awards of the D.S.C. to Flight Lieut. Cadbury and Flight Sub-Lieut. Fane are referred to in the same way, except for the omission of the words "and destroying a Zeppelin."

The British Air Services

"PER ARDUA AD ASTRA"

Under *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* London Gazette, *it is not repeated in this column.*

Royal Naval Air Service.

Admiralty, November 28th.

Lieut.-Comdr. J. I Harrison graded as Flight-Comdr., late Nov. 16th.

Temp. Lieut. (R.N.V.R.) G. W. F. Fraser granted acting rank of Lieut.-Comdr., R.N.V.R., to date Nov. 26th.

The following entered as Prob. Flight Officers for temp. service, and appointed to "President," additional for R.N.A.S., date as stated: N. R. Harben, C. T. Greenwood, F. A. Frost, V. H. Clift, J. F. R. Kitchin, H. L. P. Lester, J. C. Grant, E. H. S. Low, C. Lowther, W. E. B. Oakley, Chief Petty Officer E. J. Addis, Acting Petty Officer L. W. E. Leage, Dec. 3rd; H. C. M. Fitton, Nov. 6th; G. B. G. Scott, C. G. Brock, E. C. R. Stoneman and A. G. A. Spence, Oct. 28th.

Temp. Engr. Sub-Lieut., R.N.R., G. Towers entered as Prob. Flight Officer for temp. service and appointed to "President," additional for R.N.A.S., to date Nov. 25th; temp. commission as Engr. Sub-Lieut., R.N.R., terminated.

E. Gough entered as Temp. Warrant Officer, second grade, and appointed to "President," additional, for R.N.A.S., date Nov. 27th.

Admiralty, November 29th.

Acting Air-Mec., 1st grade, R. A. Tanner and A. A. Allan granted temp. commissions as Lieuts. R.N.V.R., and appointed to "President," additional for R.N.A.S., date Nov. 27th and Nov. 28th respectively.

C. N. Ellen granted temp. commission as Sub-Lieut., R.N.V.R., and appointed to "President," additional for R.N.A.S., date Nov. 27th.

Temp. Engr. Sub-Lieut. R.N.R., C. W. Halfhide entered as Prob. Flight Officer, for temp. service, date Nov. 28th.

Admiralty, November 30th.

The undermentioned entered as Prob. Flight Officers for temp. service, to date as stated: H. le Roy Wallace, Oct. 9th; H. E. Grundy, Nov. 9th; and J. P. Hales, Oct. 12th.

Admiralty, December 1st.

Lieut. L. G. G. Groves, to "President," for service in R.N.A.S., temp., date Nov. 30th.

A. H. Loft entered as Temp. Prob. Flight Officer for temp. service, and appointed to "President," additional, for R.N.A.S., date Nov. 22nd.

Admiralty, December 4th.

A. Williams, E. C. St. John, and C. L. D. Willcox granted temp. commissions as Lieut., R.N.V.R., and appointed to the "President," additional, for R.N.A.S., to date, Dec. 2nd.

Temp. Sub-Lieut., R.N.V.R., H. S. Keightley appointed to the "President," additional, for duty with R.N.A.S., to date, Dec. 2nd.

Royal Flying Corps (Military Wing).

London Gazette, November 28th.

Flying Officers (Observers).—2nd Lieut. E. B. B. Jefferson, L'pool. R., and to be secd.; Aug. 10th. Nov. 12th: 2nd Lieut. (Temp. Capt.) H. G. Rickards, Lond. (Howitzer) Brig., R.F.A., T.F.; Temp. 2nd Lieut. A. N. Nesbitt, R. Innis. Fus., and to be transfd. to Gen. List.

Equipment Officer, 1st Class.—Temp. Lieut. E. G. Toye, Gen. List, from the 3rd Cl., and to be Temp. Capt. whilst so emplyd.; Nov. 20th.

Equipment Officers, 2nd *Class; from the 3rd Class*:—Nov. 1st: Temp. Lieut. E. J. Howard, Gen. List; Qmr. and Hon. Lieut. L. Newman, City of Lond. Yeo., T.F. And to be Temp. Lieuts. whilst so emplyd.: 2nd Lieut. R. K. C. Maguire, S.R.; 2nd Lieut. K. D. Abercromby, S.R.; Temp. 2nd Lieut. J. W. Burt, Gen. List; Temp. 2nd Lieut. J. R. Grant, Gen. List; Temp. 2nd Lieut. S. E. Devonald, Gen. List; Temp. 2nd Lieut. J. H. Banks, Gen. List; 2nd Lieut. E. Stokes, S.R.; 2nd Lieut. W. M. Cumming, S.R.; 2nd Lieut. J. L. Luntley, S.R.; 2nd Lieut. L. Auker, Gen. List. 2nd Lieut. B. J. Nicholson, S.R.; Nov. 13th.

Memoranda.—Capt. the Hon. E. A. Stonor, R.F.C., S.R., to be Temp. Major (without the pay and allowances of that rank while specially employed; Nov. 25th. Temp. Lieut. G. Graham, Gen. List, a flying officer (Observer) takes rank and precedence in the R.F.C. and in the Army as if his appointment as Temp. Lieut. bore date Oct. 9th. The Hon. E. St. G. Caulfield, late R.F.C., S.R., to be Temp. Lieut. while employed as a recruiting officer: Nov. 7th.

London Gazette Supplement, November 29th.

Flight Commanders.—Temp. Lieut. H. D. Jensen, Gen. List, from a Balloon Officer, and to be Temp. Capt. whilst so emplyd.; Oct. 24th. Nov. 10th: Capt. F. C. Baker, D. of Corn. L.I., S.R., from a flying officer and to remain secd. From Flying Officers and to be Temp. Capts. whilst so emplyd.: 2nd Lieut. R. Gregory, Conn. Rang., S.R.; Lieut. P. C. Campbell, Arg. and Suthd. Highrs., S.R., Nov. 17th.

Flying Officers.—2nd Lieut. K. I. Mackenzie, Arg. and Suthd. Highrs., and to be secd.; July 17th. Nov. 1st: Temp. Capt. J. M. Heap, A.S.C., and to be transfd. to Gen. List; Temp. 2nd Lieut. R. N. G. Atkinson, Middx. R., and to be transfd. to Gen. List. Nov. 2nd: Capt. L. S. Platt, 17th Lrs.; 2nd Lieut. I. M. Davies, Welsh R., and to be secd. Nov. 6th; 2nd Lieut. R. A. Grosvenor, 2nd D. Gds., S.R.; Temp. 2nd Lieut. R. D. C. Blake, 10th Res., Regt. of of Cav., and to be transfd to Gen. List; Temp. 2nd Lieut. (on prob.) J. H. Cooper, Gen. List; 2nd Lieut. W. B. Melville, S.R.; Temp. 2nd Lieut. (on prob.) E. D. Howard, Gen. List. Nov. 7th: Temp. 2nd Lieut. F. G. Litchfield, Gen. List; Temp. Lieut. H. Norton, R. Lanc. R., and to be transfd. to Gen. List; Temp. 2nd Lieut. B. C. Rice, Gen. List, from a flying officer (Observer), with seniority from Nov. 22nd, 1915; Temp. 2nd Lieut. F. H. Reynell, Gen. List; 2nd Lieut. (on prob.) F. C. Craig, S.R. Nov. 8th: Temp. Lieut. G. E. Giles, Gen. List, from an Equipment Officer, 3rd Class; Temp. 2nd Lieut. (on prob.) C. F. Crapp, Gen. List; Temp. 2nd Lieut. (on prob.) J. H. Gotch, Gen. List; Temp. 2nd Lieut. (on prob.) E. O. L. Bell, Gen. List; Lieut. (Temp. Capt.) F. P. Don, Sco. Horse Yeo., T.F., from a Flying Officer (Observer), with seniority from June 16th. Nov. 9th: Lieut. A. T. Adams, Wilts. R., S.R.; Temp. 2nd Lieut. G. W. Shuter, Gen. List; Lieut. J. G. S. C. Smith-Grant, R. Scots, T.F.; 2nd Lieut. C. F. Smith, L'pool. R., T.F.; 2nd Lieut. F. P. Williams, S.R.; 2nd Lieut. F. H. Holdsworth, S.R. 2nd Lieut. G. A. Masters, London R., T.F.; Nov. 11th. Temp. 2nd Lieut. A. J. Pearson, M.C., Machine Gun Corps, and to be transfd. to Gen. List; Nov. 13th.

Balloon Officer.—2nd Lieut. (on prob.) E. L. Pape, S.R., Aug. 17th.

Equipment Officers, 1st Class.—Capt. E. R. L. Corballis, R. Dub. Fus., from a Flight Comdr.; Oct. 16th.

2nd Class.—From the 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Nov. 1st: 2nd Lieut. C. R. Fry, S.R.; 2nd Lieut. E. G. A. Lefrere, S.R. 2nd Lieut. N. Turner, S.R.; Nov. 13th.

3rd Class.—Temp. 2nd Lieut. J. H. Thorpe, Gen. List; Oct. 1st. Nov. 7th: 2nd Lieut. (Temp. Lieut.) W. Redmond, Lan. Fus. (T.F.); Temp. 2nd Lieut. (on prob.) L. S. R. Poole, Gen. List; Temp. 2nd Lieut. (on prob.) C. Rawdon-Schofield, Gen. List; Temp. 2nd Lieut. F. W. Poat, Gen. List; Temp. 2nd Lieut. (on prob.) D. G. Robinson, Gen. List; 2nd Lieut. (on prob.) W. L. Shaw, S.R.; 2nd Lieut. (on prob.) G. J. C. Gunn, Sco. Rif., S.R., and to be secd.; 2nd Lieut. (on prob.) H. Hoad, S.R.; 2nd Lieut. (on prob.) A. Graham, S.R.; 2nd Lieut. (on prob.) H. J. G. Dyer, S.R.; Temp. 2nd Lieut. H. Haddon, Gen. List; Temp. 2nd Lieut. (on prob.) J. P. Burden, Gen. List; Temp. 2nd Lieut. T. Allen, Gen. List; Temp. 2nd Lieut. (on prob.) T. F. Braines, Gen. List; Temp. 2nd Lieut. D. Armitage, Gen. List; Temp. 2nd Lieut. R. W. Atchley, Gen. List; 2nd Lieut. L. Davies, S.R.; Temp. 2nd Lieut. H. Cooke-Smith, Gen. List; 2nd Lieut. (on prob.) T. Cooper, S.R.; Temp. 2nd Lieut. S. F. Barton, Gen. List; Temp. 2nd Lieut. R. L. Cobb, Gen. List; Temp. 2nd Lieut. J. C. Courtice, Gen. List; 2nd Lieut. E. P. Lyon, S.R.; 2nd Lieut. M. J. James, S.R.; Temp. 2nd Lieut.

J. W. Jennings, Gen. List; Temp. 2nd Lieut. N. H. Knock, Gen. List; 2nd Lieut. G. W. Longstaff, S.R.; Temp. 2nd Lieut. D. M. Mackie, Gen. List; Capt. L. H. Tosswill, Worc. R, S.R.; and to be secd.; Temp. 2nd Lieut. S. N. Veitch, Durh. L.I., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) L. Wigley, Gen. List; Temp. 2nd Lieut. (on prob.) C. E. Tebbs, Gen. List; Temp. 2nd Lieut. (on prob.) F. Ward, Gen. List; Temp. 2nd Lieut. (on prob.) L. G. Stevenson, Gen. List; 2nd Lieut. (on prob.) W. H. R. Skudder, S.R.; Temp. 2nd Lieut. (on prob.) K. A. Smith, Gen. List; Temp. 2nd Lieut. (on prob.) L. L. W. Smythe, Gen. List; Temp. 2nd Lieut. (on prob.) H. Stansfield, Gen. List; 2nd Lieut. (on prob.) J. F. B. Smith, S.R.

Memorandum.—1st Cl. Air-Mech. G. M. Turnbull, from R.F.C. to be Temp. 2nd Lieut., for duty with the Military Wing of that Corps; Aug. 10th.

Supplementary to Regular Corps.—2nd Lieut. J. G. Hutt resigns his commission; Nov. 30th. The notification in the *Gazette* of Aug. 22nd of the appointment of 2nd Lieut. (on prob.) G. M. Turnbull is cancelled. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: W. B. Melville, F. P. Williams, F. H. Holdsworth, L. Davies, M. J. James, H. Stroud, L. W. White. The under-mentioned to be 2nd Lieuts. (on prob.): W. E. Nuttall; Oct. 23rd. N. Martin; Nov. 5th. A. G. Griggs; Nov. 6th. J. G. Hope; Nov. 14th.

London Gazette, December 1st.

Temporary Appointments at War Office.

Staff Lieutenant.—Capt. G. W. Williamson, M.C., Manch. R., S.R., from a Flying Officer, and to remain secd., vice Capt. E. S. Skipper, R.F.C., S.R.; Nov. 11th.

Flying Officers.—2nd Lieut. L. W. White, S.R.; Nov. 5th. Nov. 8th: Temp. Lieut. W. E. Sandys, A.S.C., and to be transfd. to Gen. List; Temp. Lieut. W. H. Segrave, A.S.C., and to be transfd. to Gen. List; 2nd Lieut. A. G. D. Alderson, Worc. R., S.R., and to be secd.; 2nd Lieut. F. K. Laverton, Glouc. R., S.R., and to be secd.; Lieut. J. Whittaker, E. Lanc. R. (T.F.); Temp. 2nd Lieut. N. C. McClelland, Gen. List. Nov. 9th.: Temp. 2nd Lieut. H. M. Over, R. Fus., and to be transfd. to Gen. List; 2nd Lieut. G. Vaughan-Jones, E. Anglian Divl. Sig. Co., R.E. (T.F.); 2nd Lieut. E. T. Curling, Lond. R. (T.F.); 2nd Lieut. (Temp. Lieut.) P. J. G. Powell, A.S.C., and to be secd.; Temp. 2nd Lieut. B. F. Rowe, R. Fus.; Temp. 2nd Lieut. F. M. Kitto, Welsh R., and to be transfd. to Gen. List; Temp. 2nd Lieut. H. G. Spearpoint, Gen. List. Lieut. S. J. Pepler, 74th Canadian Inf. Bn.; Nov. 10th. 2nd Lieut. H. Stroud, Spec. Res.; Nov. 11th.

Equipment Officer, 3rd Class.—The appointment of Temp. 2nd Lieut. (on prob.) J. Jardine, R.E., notified in the *Gazette* of Nov. 7th, is cancelled.

Experimental Officers (graded as Equipment Officers, 1st Class).—From Equipment Officers, 1st Cl., and to retain their temp. rank whilst so employed:—Nov. 1st: Temp. Lieut. (Temp. Capt.) C. E. Prince, Westmorland and Cumberland Yeo. (T.F.), with seniority from Nov. 29th, 1915; Lieut. (Temp. Capt.) A. M. Low, S.R., with seniority from Dec. 22nd, 1915.

Assistant Experimental Officers (graded as Equipment Officers, 3rd Class).—Temp. 2nd Lieut. F. C. Wilkinson, Arg. and Suthd. Highrs., and to be transfd. to Gen. List; Aug. 3rd. From Equipment Officers, 3rd Cl.:—Nov. 1st: Temp. Capt. A. G. Parsons, Gen. List, with seniority from Oct. 20th, 1915; 2nd Lieut. H. J. Poole, S.R., with seniority from Jan. 1st; 2nd Lieut. E. W. Bowen, S.R., with seniority from Jan. 7th; Temp. 2nd Lieut. J. H. Mackie, Gen. List, with seniority from May 20th; 2nd Lieut. F. A. Harper, S.R., with seniority from May 25th; 2nd Lieut. L. Mantell, S.R., with seniority from Aug. 13th.

Memorandum.—2nd Lieut. (Temp. Capt.) L. Moss, A.S.C., relinquishes his temp. rank on ceasing to be employed with R.F.C.; Oct. 30th.

Supplementary to Regular Corps.—R. H. B. Ker, from Lieut., 3rd Pioneer Bn., Canada, to be Lieut.; Dec. 2nd. 2nd Lieut. I. L. Kight resigns his commission; Dec. 2nd. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: H. J. G. Dyer, E. L. Pape, W. H. R. Skudder. The under-mentioned to be 2nd Lieuts. (on prob.):—Oct. 19th: J. A. Hutchison, F. H. Baguley, N. S. Cameron. T. Elder-Hearn; Nov. 7th.

London Gazette Supplement, December 2nd.

Flying Officers.—2nd Lieut. V. D. Siddons, Northn. R. (T.F.); Oct. 20th. Oct. 23rd: 2nd Lieut. C. D. Fellowes Staff. Yeo. (T.F.); 2nd Lieut. F. W. H. Thomas, Staff. Yeo. (T.F.); Lieut. L. L. MacLean, 8th Gurkha Rif., Ind. Army; Temp. Lieut. R. M. Wynne-Eyton, Machine Gun Corps, and to be transfd. to Gen. List; Lieut. S. J. M. White, Norf. R. (T.F.), from Machine Gun Corps; 2nd Lieut. G. E. Wilson, Sco. Rif., and to be secd. Oct. 24th: 2nd Lieut. A. W. Robinson, E. Surr. R., S.R., and to be secd.; 2nd Lieut. J. V. Tunbridge, Australian F.C.; 2nd Lieut. S. I. Winter-Irving. Australian F.C.; 2nd Lieut. R. F. Baillieu, Australian F.C. Lieut. G. C. H. Culley, Norf. R. (T.F.). from Machine Gun Corps, Oct. 25th. Nov. 9th: Temp. 2nd Lieut. W. Ross, R. W. Fus. (T.F.); 2nd Lieut. L. Butler, Yorks. L.I. (T.F.). Temp. 2nd Lieut. B. A. Taylor, Gen. List; Nov. 11th. Nov. 13th: Temp. 2nd Lieut. P. J. Barnett, R. Fus., and to be transfd. to Gen. List; 2nd Lieut. D. F. Stevenson, Sherd. Rangers Yeo. (T.F.); 2nd Lieut. (Temp. Lieut.) R. L. Whalley, E. Lanc. R. (T.F.); Temp. 2nd Lieut. (on prob.) A. C. Wyness, Gen. List; Capt. C. E. Bryant, D.S.O., 7th Hrs., and to be secd.; Lieut. J. Potter, High. L.I., and to be secd. Nov. 4th: Lieut. J. W. Boyd, 74th Canadian Inf. Bn.; 2nd Lieut. D. H. Bell, M.C., Camn. Highrs., and to be secd.; 2nd Lieut. (on prob.) W. D. B. Taylor, S.R.; 2nd Lieut. (on prob.) J. Mitchell, S.R.; Temp. 2nd Lieut. H. P. Solomon, Gen. List; Lieut. H. Kent, L'pool. R., and to be secd.; Temp. 2nd Lieut. R. L. Graham, R.A., and to be transfd. to Gen. List; 2nd Lieut. T. Ure, Sco. Rif. (T.F.); Temp. 2nd Lieut. J. Clinkskill, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. R. T. Whitney, Gen. List. Nov. 15th: 2nd Lieut. (on prob.) G. J. Scaramanga, N. Staff. R., S.R., and to be secd.; Temp. 2nd Lieut. (on prob.) H. J. Green, Gen. List; 2nd Lieut. (on prob.) T. W. L. Dickson, S.R. The appointment of 2nd Lieut. (Temp. Capt.) W. S. Farren, Hamps. Aircraft Parks, R.F.C. (T.F.), notified in the *Gazette* of Nov. 8th, is cancelled.

Balloon Officer.—Temp. 2nd Lieut. G. A. Hoghton, Gen. List; Oct. 14th.

Equipment Officers, 3rd Class.—2nd Lieut. (on prob.) R. R. Prentice, S.R.; Oct. 9th. Nov. 1st: Capt. (Temp. Maj.) R. A. Constantine, York. R. (T.F.); 2nd Lieut. (Temp. Capt.) A. Sowden, W. York. R. (T.F.); Qr.-Mr. and Hon. Lieut. H. Farquharson, Glouc. R. (T.F.); Temp. 2nd Lieut. E. Vevers, R. War. R.; Temp. 2nd Lieut. (on prob.) A. S. Poynton, R.E.; Temp. 2nd Lieut. B. E. Hobbs, Gen. List.

Supplementary to Regular Corps.—2nd Lieut. G. L. Faulkner resigns his commission; Dec. 3rd.

London Gazette Supplement, December 4th.

The under-mentioned to be Temp. 2nd Lieuts. on prob.:—

For duty with R.F.C.—Corpl. K. P. Ewart, from a Can. Divnl. Sig. Co.; Oct. 26th. Oct. 29th: Sergt. C. Dixon, from H.A.C., T.F.; Sapper J. R. Smith, from Headquarters, a Can. Divn. Nov. 5th: Sergt. H. R. Wilkinson, from Can. Mach. Gun Corps; Corpl. T. W. George, from Can. A.S.C. Nov. 6th: Qr.-Mr.-Sergt. S. McLaughlin, from Can. A.S.C.; Gunner F. H. Bronskill, Can. Fld. Arty.

Sqdn. Comdr.—Capt. D. E. Stodart, Spec. Res., from a Flight Comdr., and to be Temp. Maj. whilst so employed; Sept. 25th.

Flying Officers.—Temp. Lieut. A. H. Peck, Devon R., and to be transfd. to Gen. List; Oct. 4th. Temp. 2nd Lieut. G. E. Gibbs, Wilts. R., and to be transfd. to Gen. List; Oct. 11th. 2nd Lieut. R. L. Clegg, Lan. Fus., Spec. Res., from a Flying Officer (Observer); Oct. 18th, but with seniority from June 1st. Temp. Capt. F. H. V. Bevan, S. Wales Bord., and to be transfd. to Gen. List; Oct. 23rd. Temp. Capt. J. A. D. Dempsey, R. Ir. Fus., and to be transfd. to Gen. List; Oct. 25th. 2nd Lieut. J. Thornton, R. Scots (since decd.), and to be secd.; Nov. 8th. Nov. 10th: Temp. Lieut. G. S. Frame, R.E.; Temp. 2nd Lieut. H. F. Paton, Gen. List. 2nd Lieut. (Temp. Lieut.) R. Winnicott, Devon. R., T.F.; Nov. 11th.

Flying Officer (Observer).—The appt. of Capt. H. G. ffiske, R.F.A., T.F., notified in the *Gazette* of Nov. 3rd, is antedated to Sept. 1st.

Comdt. (graded as a Park Comdr.).—Capt. S. A. Hebden, Spec. Res., from an Equipment Officer, 1st Cl., and to be Temp. Maj. whilst so employed; Sept. 15th.

Staff Officer, 3rd Cl. (graded for pay as a Staff Capt.).—2nd Lieut. W. L. Birch, W. York, R., T.F., from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 9th.

Equipment Officers, 1st Cl.—From the 3rd Cl. And to be Temp. Capts. whilst so empld.: Temp. Lieut. C. Porri, Gen. List; 1st Oct. Lieut. T. W. Winter, Spec. Res.; Nov. 1st.

3rd Cl.—2nd Lieut. (on prob.) A. C. Day, Spec. Res.; Sept. 29th. (Substituted for the notification in the *Gazette* of Oct. 19th.)

Memoranda.—Sept. 22nd, 1916: The under-mentioned from R.F.C., to be Temp. 2nd Lieuts. (on prob.) for duty with the Mil. Wing of that Corps: Sergt. G. Lynch; Nov. 9th. Acting Corpl. C. G. J. Silcock; Nov. 24th.

Supplementary to Regular Corps.—The Christian names of 2nd Lieuts. Charles John Raymond Milton and John Standen Shaw are as now described, and not as in the *Gazettes* of Mar. 30th and Jan. 6th, respectively. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: R. R. Prentice, W. D. B. Taylor, P. R. Aitken, W. G. Duffield, J. Mitchell, T. Cooper, F. C. Craig, T. W. L. Dickson. J. Witt-Mann to be 2nd Lieut.; Sept. 10th. The under-mentioned to be 2nd Lieuts. (on prob.): A. C. Simpson; Oct. 10th R. H. Moore; Oct. 12th. Capt C. J. Thomsen, Australian I.F.; Oct. 23rd. S. Blackley; Nov. 9th. Nov. 16th: V. A. B. Learoyd, H. D. Lehmann. E. N. L. White; Dec. 1st.

Aeronautical Inspection Department.

London Gazette Supplement, November 29th.

A. S. Ellerton to be Temp. Hon. Capt. whilst employed as an Inspector, A.I.D.; Oct. 1st.

AIR WORK IN EGYPT.

In the despatch published in the *London Gazette* on December 1st, from General Sir Archibald Murray, describing the operations in Egypt during the four months ending September 30th last, there are the following references to aircraft work:—

"More than half the month of July passed says the despatch without any important occurrence on the Eastern Front. On July 19th, however, the situation suddenly changed. A reconnaissance by the Royal Flying Corps revealed the fact that a large enemy force had moved westwards from El Arish and established itself on the line Bir El Abd-Bir Jameil-Bir Bayud. . . .

"I cannot speak too highly of the work of the Royal Flying Corps during the whole period. Their work was extremely arduous and exhausting. The average total daily reconnaissances during the period amounted to 23¼ hours. and during the first five days of August to as much as 31½ hours. Many pilots and observers were out two or three times a day for several consecutive days under very accurate anti-aircraft fire, and were frequently engaged in air combats with enemy machines of superior power. Special commendation is due to Lieut.-Colonel P. B. Joubert Officer Commanding Royal Flying Corps, and to Major H. Blackburn, Royal Flying Corps, who commanded the detachment at Kantara."

In the list of officers "mentioned" for their services are the following:—

"*Royal Flying Corps.*—Groves, Major (Temp. Lieut.-Col.) P. R. C., Shrops. L.I.; Carden, Major (Temp. Lieut.-Col.) A. D., R.E.; Joubert de a Ferté, Capt. (Temp. Lieut.-Col.) P. B., R.A.; Fraser, Capt. C., N. Staff. R.; Albrecht, Capt. V. A., M.C., Manch. R.; Grant-Dalton, Capt. S., D.S.O., York. R.; Jenkins. Capt. F. H., Spec. Res.; Watt, Capt. O., Australian Flying Corps; Minchin, Lieut. (Temp. Capt.) F. F., M.C., Spec. Res.; Tipton, Lieut. (Temp. Capt.) R. J., R.F.A.; Pretyman, Lieut. E. B., Som. L.I.; James, Lieut. H. H., Manch. R.; MacLaren, 2nd Lieut., A. S. C., M.C., K. O. Sco. Bord. (Spec. Res.); Coates, 2nd Lieut. W. A.; Brown, Temp. 2nd Lieut. J., R.F.A. (died of wounds); Minter, 2nd Lieut. M., Spec. Res.; West, Temp. 2nd Lieut. T. J.; Muir, Temp. 2nd Lieut. S. K.; Paris, Temp. 2nd Lieut. D. K., M.C.; McMahon, 1st Class Warrant Officer P., Australian Flying Corps; Harman, No. 222 Flight-Sergt. C. J., Australian Flying Corps; Lewis, No. 63 Flight-Sergt. A. E.; King, No. 874 Flight-Sergt. C. R.; Hunt, No. 3552 Corpl. J. S.; Roberts, No. 3201 Corpl. A.; Bacon, No. 265 1st Class Air-Mech. L. B., Australian Flying Corps; Cox, No. 3068 Corpl. A.; Holmes, No. 3094 1st Class Air-Mech. H.

SIX MONTHS AIR WORK IN FRANCE.

The following excellent summary of the "wastage" of aeroplanes on the Western Front, as revealed by the daily official *communiqués*, was published in the *Times* of December 5th:—

"There are certain features of the official reports of the air warfare on the Western Front during November which distinguish them from those of any previous month since the Somme offensive began on July 1st. Perhaps the most curious is the sudden cessation, halfway through the month, of any mention by German Main Headquarters of aerial engagements. The last claim was made on November 11th.

"Another feature of such reports as were made in November—there were only three altogether—was their vagueness. On November 4th Main Headquarters claimed that nine, and on November 11th that 10 enemy machines were shot or brought down in air fights or by anti-aircraft guns, but not the slightest indication was given on either date of the time or place of these events. A third fact to be noted is that since the death of Boelcke at the end of October the German Flying Service has become as anonymous as the Royal Flying Corps.

"The wastage of aircraft in November was less than in any of the previous four months. According to the official *communiqués* 148 British, French and German machines are stated definitely to have been brought down, but this is not the complete total, because on two occasions British Headquarters reported that 'many others' and 'several others' beside the number mentioned were driven down. Of the definite total 32 were British—admitted by General Headquarters to have been lost or not to have returned. As an offset the British destroyed 24, captured seven, and drove down damaged 26 German machines. In addition, five other enemy aeroplanes were brought down by members of the Royal Naval Air Service operating under the French military authorities.

"The French claim 50 enemy machines. Of these, nine were destroyed, four fell into the hands of the French, and 30 were brought down in aerial fights, and, presumably, wrecked. The list of successful airmen is still headed by Lieut. Guynemer, who has scored his twenty-third victory. Guynemer has a record for 'braces' which now surpasses that achieved by Boelcke. In November alone he brought down two German aeroplanes on each of three days. Guynemer is followed by Lieut. Nungesser and Adjudant Dorme. who respectively secured their eighteenth and sixteenth 'victim' during the month.

"For the three days on which reports were made the Germans claim to have shot down 36 enemy machines.

"The following table gives the number of aeroplanes 'accounted for' since June 1st, as shown in the daily official reports of British, French and German Headquarters:—

	British.	French.	German.
June	7	28	37
July	48	31	86
August	26	42	121
September	48	68	206
October	42	25	104
*November	32	4	112
Total	203	198	666"

* The figures for this month are subject to the above observations as to the incomplete German returns.

A German Claim.

A telegram sent out from Berlin on December 1st stated: "One of our submarines recently came across a damaged British aeroplane off the mouth of the Thames. The occupants of the machine, two British officers, were taken prisoners, and the aeroplane destroyed."

AVIATION WIRES, THEIR FASTENINGS AND CONNECTIONS.

By JOHN A. ROEBLING'S SONS CO.*

In reference to our investigations of aviation wires and cables, their fastenings and terminal connections for stays, we have failed to find from past practice anything that would allow us to determine the best lines on which to proceed; therefore our study is not limited to any one stay design.

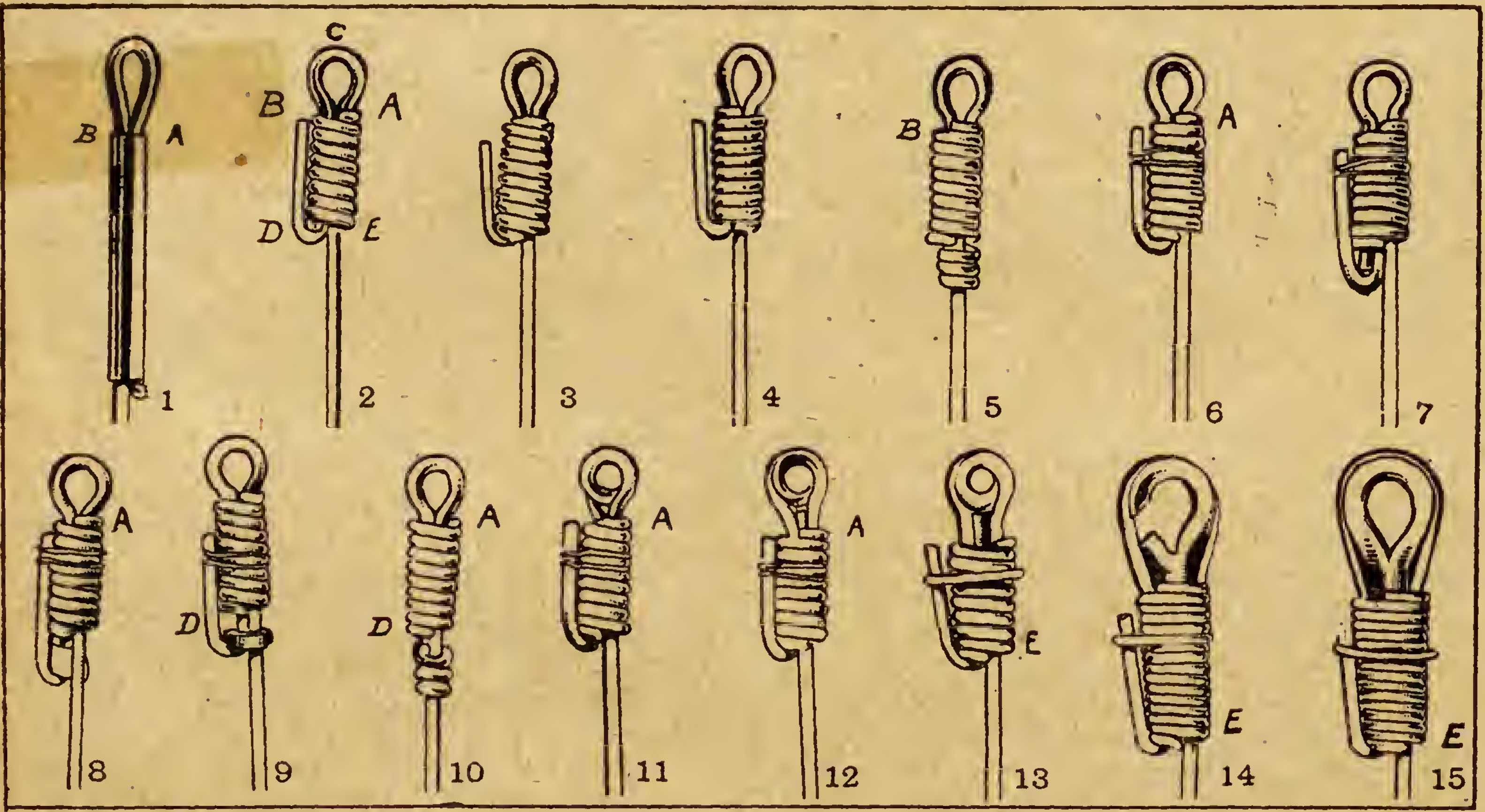
In making our investigation we have aimed to eliminate the use of acid and solder, imperfect bends, flattening of cable on bends, injury to wire, strand and cord due to unskilful handling of material in the field; and based on our study of present methods of manufacture of aeroplanes, we believe it is possible to manufacture the complete stay here at the factory, proof test same to 50 per cent. of its ultimate strength, measure same under stress, and therefore eliminate any uncertainty as to strength of terminal connection, length of stay and workmanship.

On this basis our research covered not only the terminal connection for shop attachment, but also a connection that would allow repairs to be made in the field without requiring the use of blow torch and solder, and from the following tests it will be readily seen that the development eliminates any doubt on this point.

Figure 2.

The standard terminal in Europe is shown in Fig. 2. This consists of an oval spring wire ferrule applied in almost the same manner as the flat wire ferrule in Fig. 1. Particular emphasis is placed on the method of forming the eye in the stay before applying the ferrule. Radius of curve at A and B, Fig. 2, must be exactly the same as radius at C. This is called a perfect eye. No solder is used. The ferrule is made of wire of the same size as wire in stay, and is "spring" quality. Nine convolutions constitute the standard length of ferrule. The hole in the ferrule is oval, and a snug fit for the two wires forming the eye of stay. Both wire and ferrule are tin coated. The free end of the wire is bent back over the ferrule, and is not fastened in any way. This holds the ferrule firmly against the shoulder at A and B.

Tests made on stays having this type of terminal did not show very satisfactory results; 80 per cent. of the tests showed an efficiency of less than 65 per cent., the free end of the wire slipping through the ferrule at failure of the stay. In the remaining 20 per cent. of the tests the wire broke at A, the stays having an average efficiency of 68 per cent. of the total strength of the wire.



We find present practice considers "the solid wire stay;" consisting of one wire of suitable diameter and known to the trade as "aviation wire"; "the strand stay," consisting of either 7 or 19 wires stranded together and known to the trade as "aviator strand"; also "the cord or rope stay," consisting of 7 strands twisted together forming a rope, the strands being either 7 wires or 19 wires; and the rope known to the trade as "aviator cord."

The Solid Wire Stay.

Figure 1.

Fig. 1 shows the type most generally in use. An eye or loop is formed in tinned aviator wire and a ferrule made by wrapping a thin flat strip around both wires. The free end of the wire is then bent back over the flat ferrule, holding it in place, and the whole terminal dipped in solder. This type of terminal is far from being satisfactory. Its mechanical strength is low and variable. The process of soldering involves the possibility of establishing a source of corrosion, as well as injuring the quality of the wire. The making of such a terminal is almost necessarily a factory proposition, and provides no means for quick and efficient field replacements.

Figure 3.

Fig. 3 shows eye having radii A and B different from C, which is not allowed in foreign specifications and practice. Tests made on terminals having an eye formed as in Fig. 3 always resulted in pulling through the free end of the wire at low efficiency.

Figure 4.

In order to determine whether the direction of pitch of the spiral spring ferrule had any influence in determining the efficiency of the stay, sample terminals having left-hand ferrules as in Fig. 2 and right-hand ferrules as in Fig. 4 were made with a perfect eye in both cases, tested and compared. The left-hand ferrule clearly showed an efficiency of about 5 per cent. more than the right-hand ferrule. In testing the latter the free end of the wire slipped in every case.

Figure 5.

In Fig. 5 an effort was made to secure the free end of the wire against slipping when strain was applied to the stay by wrapping this end around the main stay wire. Tests on this construction showed an average efficiency of 72 per cent., fracture taking place at B.

Figure 6.

Another method of securing the loose end consisted of tying the end down on the ferrule with fine annealed wire, as shown in Fig. 6. Tests made on this construction showed an average efficiency of 70 per cent., fracture taking place at A.

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* From the First Annual Report of the American National Advisory Committee for Aeronautics.

CONCLUSIONS BASED ON ABOVE TESTS.

Observations made during tests of terminals 5 and 6 showed clearly that the weak points of this construction existed at B and A respectively, and that it was necessary to increase the friction between the walls of ferrule and the wire of the stay under strain to increase efficiency. Reliable information at hand showed that the same conclusions had been aimed at by foreign engineers stationed in America, and that they had solved the problem by soldering the spring ferrule terminal in the same manner that Americans had adopted with the flat wire terminal.

Horn's Improved Terminal Connection.

In an effort to avoid the use of solder with its many objectionable features, types of construction as shown in Figs. 7 to 15, inclusive, were originated and tested. In every case the spring ferrule with left-hand pitch was adopted. The loose end of wire was secured with a tie or simple wire loop or clip, as shown. Numerous tests made at intervals throughout the entire series of tests with wires having strengths of 1,600, 1,800 and 2,300 lbs., showed conclusively that there is no difference in efficiency of stays using wire of any of the above strengths.

Figure 7.

Fig. 7 shows a wedge between the ferrule and free end of wire so placed that as strain is applied to the stay and the bend in the free end of wire drawn toward the ferrule, the wedge is forced in and thus increases the friction between the wall of the ferrule and the main stay wire. Average efficiency secured, 82 per cent.; range of efficiency, 80 to 84 per cent. Fracture at A in ferrule.

Figure 8.

Fig. 8 shows two wedges with a connecting yoke. The wedges enter on each side between the two wires and force them apart and against the wall of the ferrule as strain is applied. The wedges are forced in by pressure on the connecting yoke which passes under the bend of the free end of the wire as this free end is drawn into the ferrule under strain. Average efficiency of terminal in test equals 80 per cent. Range of efficiency in tests made, 79 to 83 per cent. Fracture at A.

Figure 9.

In construction of Fig. 9 two wedges were used as in Fig. 8, but the yoke was replaced by a washer with two holes in it encircling both wires of the stay. Pressure on the wedges was supposed to be secured under strain by the drawing in of the loose end under strain. This result was not realised, as the washer became locked on the main wire and broke the loose end at D. Efficiency secured was only 70 per cent.; range, 60 to 75 per cent.

Figure 10.

In Fig. 10 two wedges were used as in Figs. 8 and 9. The free end of the wire was wrapped around the main stay wire and pushed in the wedge as initial slippage occurred. Average efficiency, 84 per cent.; range, 75 to 87 per cent. Fracture at A in ferrule.

Figure 11.

Fig. 11 shows a double eye with no wedge. Standard straight ferrule with free end tied. This type of eye could only be used on stays when turnbuckles or hooks to be attached had open eye. Average efficiency in test, 80 per cent.; range, 74 to 82 per cent. Fracture at A.

Figure 12.

Fig. 12 again shows a double eye in stay with a single wedge between wires on the eye end of the ferrule. As ferrule is drawn down against shoulders A and B, the wedge is forced in. This increases friction of wires against ferrule at A and B, but not at D and E. Average efficiency, 85 per cent.; range, 80 to 87 per cent. Fracture at A.

Figure 13.

Fig. 13 shows a construction consisting of a double eye in stay, a single wedge under the eye, and an oval spring wire ferrule tapered at the same angle as the wedge. In this case the pressure of the wedge forces both wires throughout the entire length of the ferrule against the walls of the ferrule, and this increases friction on the ferrule uniformly as the strain increases on the stay and reduces the strain at the weak points A and B proportionately. Fracture always took place at E. Average efficiency, 94 per cent.; range, 92 to 95 per cent.

In Fig. 13 we have the most efficient terminal tested. It has none of the objections of a soldered terminal. It is simple, parts are inexpensive, strong and few in number. It is an ideal terminal for emergency use in the field.

Figures 14 and 15.

Figs. 14 and 15 show modifications of this type to overcome any objections which might be raised to the double eye. The wedge and a substantial thimble are combined in one piece. To secure more points of contact, and consequently greater friction, and also for greater flexibility, the taper ferrule is made of finer wires and with more convolutions. The wedge thimble may be open or closed, as desired. Fracture took place at E. Average efficiency, 94 per cent.; range, 92 to 96 per cent.

Summary of Tests for Efficiency.

Terminal.	Average efficiency.	Range of efficiency.	Points of fracture.	Remarks.
	Per cent.	Per cent.		
1 ..	80	60–90	A or B	American, soldered.
2 ..	65	60–75	A or slipped	Foreign, proper eye.
3 ..	62	60–65	Slipped	Foreign, improper eye.
4 ..	60	59–61	Slipped	Right-hand ferrule.
5 ..	72	65–75	B	End wrapped around stay.
6 ..	70	68–78	A	End tied to ferrule.
7 ..	82	80–84	A	Wedge under hook.
8 ..	80	79–83	A	Two wedges with yoke.
9 ..	70	60–75	D	Two wedges with washer
10 ..	84	75–87	A	Two wedges end wrapped.
11 ..	80	74–82	A	Double eye, no wedge.
12 ..	85	80–87	A	Double eye, one wedge.
13 ..	94	92–95	E	Tapered ferrule, double eye, wedge.
14–15	94	92–96	E	Thimble wedge T. F., single eye.

Note.—These tests were made with wire having a diameter of 0·102 inch and a strength of 1,600, 1,800 and 2,300 lbs. No difference in efficiency of stay was found by using wire of any of these strengths.

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"X 54" Raid, November 27th–28th.

German Version.

Berlin, November 28th.

"On the night of Nov. 27th–28th, several naval airships successfully bombed blast furnaces and industrial establishments in Central England. At several places conflagrations were observed. The defence was extraordinarily powerful. One airship fell to hostile anti-aircraft, and came down near Scarborough. A second airship has not returned, and she must be considered lost. The other airships have returned, and have landed.—(Signed) CHIEF OF ADMIRALTY STAFF."

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R.F.C. Observers and Promotion.

AN Army Order, issued with the December Orders, states that:—

"It has been decided that, in future, officers who have qualified as observers with the Royal Flying Corps in the field may, within the authorised establishment, be appointed Flying Officers (Observers) instead of passing through the intermediate grade of Qualified Observers.

"As Flying Officers (Observers) they will receive pay at the rate of 12*s*. a day, and flying pay at 5*s*. a day under Article 226A, Pay Warrant, will be issued continuously while employed as observers in an area of active operations.

"It has also been decided that officers so appointed shall take their places in the list of Flying Officers from the date on which they embark for overseas in the case of officers joining at home, or from the date of joining the Royal Flying Corps in the field in the case of those obtained locally. This will give them seniority in the Corps as Flying Officers, but they will not be entitled to receive pay as Flying Officers (Observers) prior to the date of qualification.

"Whilst serving as observers on probation they will receive flying pay at 3*s*. a day, under Article 226A, Pay Warrant."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

New Club Premises.

The arrangements for the alterations, decorations, furnishing, &c., of the New Club House are in the hands of a special Committee, and the work is progressing very satisfactorily. There will be a billiard room, smoking lounges, buffet, reading and writing room, dining room and bedrooms. The house is situated within three minutes' walk of the present Club premises.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Nov. 28th, 1916	11,018	19	8
Collected at the Westland Aircraft Works, Yeovil (Fifty-ninth contribution)	0	16	2
A. Dukinfield Jones	5	0	0
L. M. Argall, A. R. Weekes, R. K. Weekes ..	0	13	0
F. E. Rosher: First instalment of half the royalties on sale of Flight-Lieut. Harold Rosher's Letters	50	0	0
Total, December 5th, 1916	11,075	8	10

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.

The Car.

No. 3, Clifford Street, New Bond Street, W. The new premises of the Royal Aero Club.

THE ROLL OF HONOUR.

Reported by the War Office:—

Killed.

Lieut. G. L. Colomb, London and R.F.C.
2nd Lieut. P. McC. Haarer, R.F.C.
2nd Lieut. A. C. Laird, Black Watch and R.F.C.
Lieut. N. Hargreaves, E. Lancs. and R.F.C.

Previously reported Missing, now reported Killed.

Capt. A. Skinner, S. Lancs. and R.F.C.

Wounded.

Lieut. F. A. George, Northumberland F., attd. R.F.C.
Lieut. A. L. Harrow-Bunn, Sherwood For., attd. R.F.C.
Lieut. W. E. Hazelton, W. Yorks., attd. R.F.C.
2nd Lieut. B. H. M. Jones, R.F.C.
Lieut. A. P. Maurice, A.S.C., attd. R.F.C.
2nd Lieut. F. S. Moller, R.F.C.
2nd Lieut. E. P. Roberts, R. Sussex and R.F.C.
Capt. G. L. Watson, W. Yorks. and R.F.C.
2nd Lieut. E. G. Whelon, R. Sussex and R.F.C.
2nd Air Mech. A. L. Maude, R.F.C.

Previously reported Missing, now reported Wounded and Prisoner of War in German hands.

2nd Lieut. R. Wood, W. Yorks and R.F.C.

Missing.

2nd Lieut. H. B. Begg, R.F.C.
2nd Lieut. B. W. Blayney, R.F.C.
2nd Lieut. W. B. Clark, Yeomanry and R.F.C.
Lieut. R. Corbett, Yeomanry and R.F.C.
2nd Lieut. J. T. Hanning, R.F.C.
Major L. G. Hawker, V.C., D.S.O., R.E., attd. R.F.C.
Capt. G. A. Parker, Northampton, attd. R.F.C.
Lieut. V. A. Strause, A.S.C., attd. R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. R. C. Dingley, Worcester, and R.F.C.
2nd Lieut. C. Kennard, R.F.C.
Lieut. J. B. Lawton, Buffs (E. Kent), and R.F.C.
2nd Lieut. N. Middlebrook, Rifle B. and R.F.C.
4043 2nd Air-Mech. B. Digby, R.F.C.
2173 Sergt. G. J. Morton, R.F.C.

It has been unofficially reported that Capt. R. J. Lillywhite, R.F.C., the well-known Hendon pilot, has been killed in an aeroplane accident at the front.

AIRISMS FROM THE FOUR WINDS

GENERAL SIR ELLIOTT WOOD's utterances should always be given heed. But we are sorry to see that he has laid down in such very *ex cathedra* manner that all lighting—or, rather, the reverse—regulations should at once go by the board and let every mother's child in the country do as he or she jolly well pleases about subduing or increasing their lighting arrangements. The only argument put forward by the General against the so-called silly regulations in force is that if anybody in the country likes to take the risk, why shouldn't they? But there are others, surely, General? How about residents near at hand or in adjacent villages? Are they to have no voice in the matter? After all the Zepp. pirate is, whatever his intentions may be, not positively famed for accurate pilling, and judging by past experiences his missiles usually hit anything except what they are supposed to be aimed at. Again, the rest of the occupants of the General's own house may not be quite in accord with his Dictatorship's views, and would certainly be in a bit of a quandary as to whether to take their risk against their better judgment, to protest meekly, or pack up their traps and get clear of the danger zone. It would be curious to see the result of a secret ballot—for and against—of all those concerned in the General's household and the adjacent neighbourhood.

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A propos of this question, a timely little leaflet has been issued by the Postmaster-General, drawing attention to the necessity for the renewal of the Government Air Raid Insurance certificates for household goods, &c. (not exceeding £100 in value). Holders of expiring policies desiring to obtain the continued benefits of the scheme should see to obtaining one forthwith from their local post office.

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IT was but a natural outburst of enthusiasm the other night at the Alhambra Theatre, when the audience learnt from the manager that Lieut. Louis Noel was sharing with them the enjoyment of the entertainment. Quite a gathering of old Hendon favourites was with the hero of the Salonica–Sofia–Bucharest flight, including Mr. Claude Grahame-White, Capt. B. C. Hucks, Lieut. Tuck and M. Osipenko, the intrepid Russian pilot, besides Sir William Bull and Mr. Alan Burgoyne, M.P. The impromptu "extra turn," finishing up with the "Marseillaise," was a pleasant interlude for shortening the interval.

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ONCE again, as apparently General French's assurance has not yet got home, it has been thought desirable to officially inspire confidence in the general public as to the arrangements in force for deceiving the Hun enemy from above, being adequate. Major-General Sir Francis Lloyd takes up the theme this time, in response to an inquiry from the Southwark Council. Sir Francis says:

"All possible steps are taken for protecting life and property in London on occasions of attack by aircraft, and only such lights are permitted on railways and tramways as are absolutely necessary to ensure the continuance of traffic, which is of the greatest national importance.

"From observation made it is interesting to note that sparking from electric trains and trams tends rather to confuse than to assist hostile aircraft in finding their way over London.

"Further, it is not considered desirable to issue public warnings of impending air raids or to notify the public when the danger is past."

It is to be hoped Londoners will assimilate these conclusions and be content to just go on blundering along in darkness for the next five or ten years of the war, and thus give our officials a chance to get a move on in other quite as important directions.

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LONDON after all is lucky by contrast to some other towns in this little island of ours. Away up north-east one man last week captured "21 days without" for lighting a match in the street just when a Zepp. in the vicinity was looking for this form of beacon, while another miscreant escaped the court minus 40*s*. Perhaps the latter's was only a little one.

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THE effect in neutral countries of the Zepp. London raids may be reasonably gauged from the following view, just by way of sample, of the *New York World* :—

"After the destruction of six air machines in the last three months' raids over England, even the Germans must question their value, except for limited operations. As eyes for the fleet they have been used to good purpose, but for attack, even under favourable conditions, they are not nearly so formidable as had been thought. The belief that they were destined for a campaign of terrorism against England was fondly cherished in Germany, but they have not inflicted any serious damage, and the whole business has been rather futile except for stimulating recruiting in Great Britain and provoking reprisals."

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STILL another attempt is to be made in London to open up the aircraft raid damage question. The Lord Mayor has this time been appealed to by business citizens to intervene, by presiding at a Mansion House meeting, at which the views of the City are to be expressed in a resolution urging the Government to "abandon the insurance scheme and agree to compensate sufferers out of national funds."

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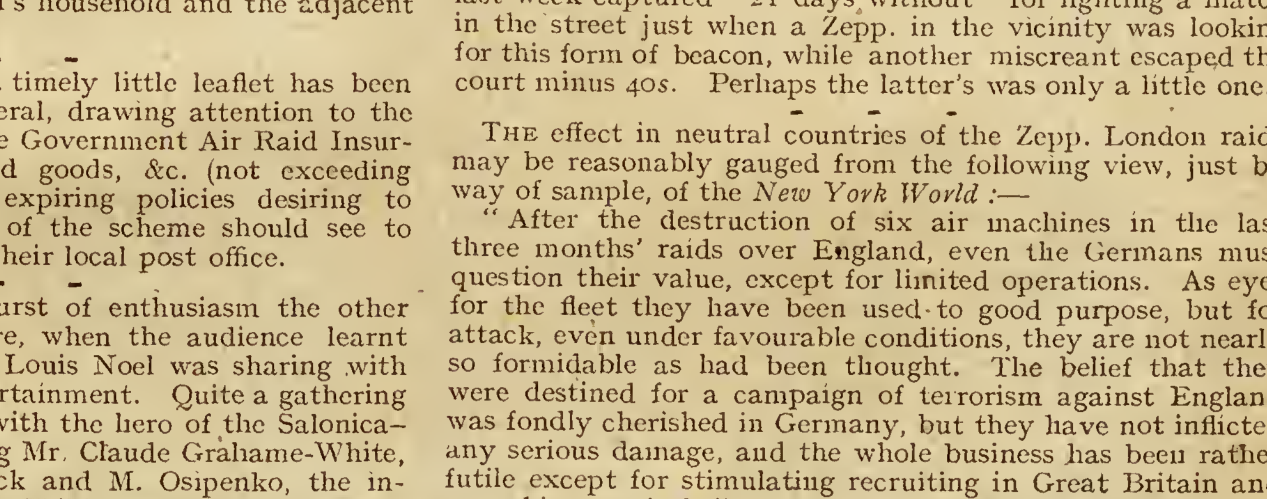
WHATEVER the Government may think about it, some of the naval and military authorities are desirous of letting the



The German Halberstadt single seater, of which a good deal has been heard lately.—This machine, it will be noticed, has Morane type *fuselage* and tail planes. The large stationary engine is fairly effectively cowled in so as to reduce head resistance. Although being a comparatively small machine it has two pairs of struts on each side, probably necessitated by the large, heavy engine. This is one of the types with which the German pilots are getting some of their own back for our air ascendancy during the past.

Parliamentary Air Committee obtain an insight into the effectives of the Air Services. Some 80 members of the Committee last week had a look around at one of our important naval bases, where they had not only a sight of things, but were initiated into practical seaplane work, and were duly impressed in more ways than one.

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ZEEBRUGGE raiding has become a little more open, but there is enormous room for development, now that past obstacles have been overcome. With a really free hand, oh! what a surprise it would be to a lot of folk to see what they would see.

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IT is always illuminating to get the other fellow's views, and therefore the following account of the Allies' air attacks on South Germany, as given by *Flugsport*, is of interest in many ways. On October 12th, between 3 and 5 in the afternoon, the story runs, several squadrons of hostile aeroplanes—between 40 and 50 machines in all—dropped bombs on Donaueschingen, Allmenshofen, Hüfingen, Eschweiler, Haslach and Rottweil, without, however, doing any damage of military importance. Private property was damaged to a certain extent, and a few civilians were slightly injured. The total number of casualties is 26. Of the attacking machines, nine were brought down by our pilots and anti-aircraft guns, one of these being English. The inhabitants of Bremgarten, many of whom were working in the fields, had a specially exciting time. For the third time they witnessed how hostile aeroplanes were forced to land on village fields. The French machine was pursued by several German aeroplanes, and was finally compelled to land. Both occupants were slightly wounded, and were taken prisoners by the crews of three German machines which had alighted near by. The bombs on board the French machine exploded, and the French aviators warned the population not to go near the machine. In Freiburg an English aeroplane was hit by anti-aircraft guns and forced to land. In spite of a severe wound in the head the pilot had the presence of mind to glide down into the Freiburg training ground. The officer was taken to hospital. A second machine was shot down between Lehen and Hugstetten, while a third fell in flames near Haslach after a fight. Both occupants were dead. Yet another machine was forced to land at Iringen, while two others came to grief at Breisach. Two more came down at Krotzingen and Müllheim respectively. In the latter was found an English naval officer.

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THE following summary of the machines brought down is given by *Flugsport*:—

"Farman biplane. Motor: Renault, No. 54394. Occupants: Pilot, Adjutant Baron; machine gunner, Sergt. Andre Guerineau. Both dead. Shot down in air fight at Widensolen, near Neubreisach.

"Farman biplane. 130 h.p. Renault, No. 55469. Occupants: Pilot, Armand Georges; machine gunner, Ernest Jouan. Both dead. Shot down in air fight at Ihringen, near Neubreisach.

"Breguet biplane, No. 534. Motor, 220 h.p. Renault, No. 5477 (12-cyl.). Occupants: Pilot, Lieut. Rockey; bomber, Sergt. Sterdec. Both taken prisoners. Shot down in air fight at Oberenzen, near Colmar.

"Breguet biplane IV, No. 229. Motor: 220 h.p. Renault, No. 54561. Both occupants dead. Shot down in air fight at Rüstenhart, near Neubreisach.

"Breguet biplane IV. Motor: 220 h.p. Renault. Occupants: Pilot, Sergt. Bouot; bomber, Delcroix. Both taken

SOME MORE GERMAN PILOT RECIPIENTS OF THE 430,000 ODD IRON CROSSES.—Top photos., left: Lieuts. Reinhardt and Zahn. Centre: Capt. von Jena, Capt. Scholi, Major von Loeben, Count Schall. Right: the well-known pilot Ingold. Bottom photos., left: (names not given by *Flugsport*). Right: Lieuts. Saenger, Baas, Hahn, Pilot Ingold, Lieuts. Hug and Bremer, Sergt. Reichert.

prisoners. Shot down in air fight at Bremgarten, near Müllheim.

"Sopwith biplane A1, No. 9660. Captured intact. Motor: Clerget, No. 260. Occupant: Sub-Lieut. Bukerworth. Wounded, taken prisoner. Shot down in air fight over Freiburg Aerodrome.

"Breguet biplane, No. 538. Motor: Renault, No. 49501. Occupants both dead. Shot down in air fight at Umkirch, near Freiburg.

"Breguet biplane, No. 436. Motor: 12-cyl. Renault, S. VI., No. 358. Occupants: Pilot, Sergt. Mottay, taken prisoner; bomber, Corpl. Marchand, dead. Shot down in air fight at Steinbach (on the Haslach-Offenburg railway line).

"Breguet biplane, No. 9176. Motor: 220 h.p. Renault, No. 54281 (12-cyl.). Occupants: Pilot, Lieut. Neumann, prisoner; bomber, Sergt. Vitty. Shot down by anti-aircraft guns at Buggingen, near Müllheim."

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To this list, editorial comment says that what is specially interesting is the fact revealed in this connection, that an American squadron took part in the raid, and thereby lost a number of the best American pilots, such as Norman Prince, one of the founders of the American Flight League in France, and Pilots Chapman and Rockwell. How *Flugsport* learnt this "fact," however, does not emerge, as neither of the names appear in their list. Equally interesting is the fact that France lost one of her crack pilots of the moment, Adjutant Baron.

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In one of the Prussian casualty lists the names of several well-known aviators are contained, one of which may be mentioned, Capt. Günther von Detten, who will be remembered in connection with pre-war races in Germany.

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During the night of September 6th the works of the Luftfahrzeug-Gesellschaft, at Adlershof, were burned down. It is thought that incendiarism is out of the question. As far as can be ascertained only six or seven complete machines were burned, and about ten *fuselages*. All other machines, models, templates and jigs are said to have been saved. Arrangements have been made to carry on work elsewhere.

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The German flying ground at Halten, which has not been in use for some time, is now occupied by the Deutsche Fliegerschule, tuition being given on Albatros biplanes, under the instruction of the German pilot, Hausmann. The one-time Eichwalde Flying School has been taken over by the Zentrale für Aviatik in Johannisthal. Special courses in the theory as well as practice of flying have been established, the latter being in the hands of instructors Krüger and Schroff. Albatros and Rumpler biplanes are being used.

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The aircraft works of the Gothaer Waggonfabrik have been transferred from Gotha to Staaken, near Spandau, where in future the construction of the well-known Gotha seaplanes will be carried out.

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Arrangements are being made, and are said to be nearly complete, to create a new concern for the construction of aeroplanes and motors. Some German business men and one of the large banks in Buda-Pest are responsible. The new firm, if it materialises, is to have its works at Komitat Somogoy, on the Balaton Lake (Plattensee), Hungary, where, it is thought, the conditions will be almost ideal for the manufacture and testing of seaplanes. The capital is reported to be "several" million marks.

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A new firm has been established in Hungary for the manufacture of aeromotors, under the title, after allowing for the native vernacular, of "The Ganz-Fiat Hungarian Aeromotor Works, Ltd." It is to be run in conjunction by the Ganz and Co. Danubius Machine-, Coach- and Shipbuilding Co., Ltd., and the Austrian Fiat Works. The capital of the new limited company is put at a couple of million crowns.

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The Zepp. Bogey.—Mother (*seizing recalcitrant son by the nether garment*): "Now then, young Albert, you come indoors."

Hero: "No—o! Wants to see Zeppelins."

Mother: "'Ere, if you ain't a good boy I'll tell the Zeppelins not to come any more."—*Punch.*

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal) of December,* 1906. "Flight" *was founded in* 1908.

M. Santos Dumont's New Aeroplane.

M. Santos Dumont is not disclosing much in the way of particulars about his new machine. That it is to be provided with a 100 h.p. motor we already know, and he has now vouchsafed the information that the wings will be considerably smaller than in the first machine, which he now regards as purely experimental. Other details of construction are not forthcoming, but he anticipates that he will be able to attain a speed in the new machine of 120 kiloms. per hour.

An Antoinette Aeroplane.

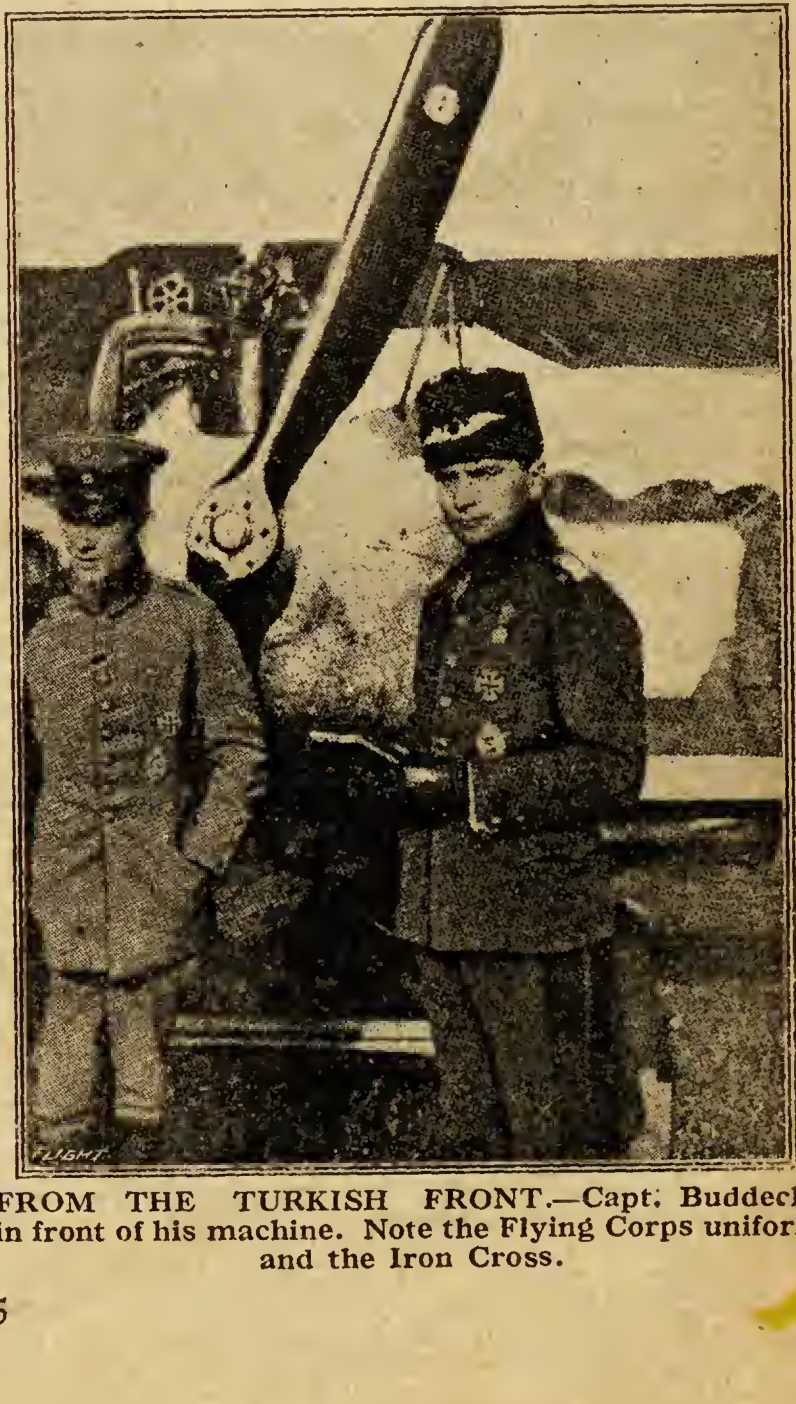
The Antoinette Co. are building an aeroplane, to carry two persons, the joint design of Capt. Ferber and M. Levavasseur, to be equipped with one of the Levavasseur motors. The aeroplane is to be manipulated by Capt. Ferber, and we gather that the Antoinette Co. are prepared to build aeroplanes as a regular thing for all who wish to experiment personally.

"La Patrie."

There is little further news of "La Patrie," excepting that having been taken over by the military, she is now entirely in the hands of professional soldiers, and on the 28th went out with Captain Voyer as pilot and Lieut. Bois as assistant pilot, and the mechanics Duguffroy and Rey. The airship went out at 10.18 in the morning, and concluded the ascent at 11.20, being thus 1 hr. 5 mins. in the air.

Lengthy Balloon Journey.

A balloon journey of 402·46 miles in 16 hours was accomplished by Mr. Leslie Bucknall, who left Wandsworth Gas Works on Tuesday afternoon in last week in his balloon, "Vivienne IV," passed over Rye in Sussex, crossed the Channel at Le Touquet, passed over Amiens, Reims and Chaumont during the night, and descended ultimately at Nevy les Dole, in Switzerland, at dawn on Wednesday morning.



FROM THE TURKISH FRONT.—Capt. Buddecke in front of his machine. Note the Flying Corps uniform and the Iron Cross.

Armchair Reflections

by the "Dreamer"

If it were not that I know this weather brings discomfort to those who are fighting for our liberty on land and sea, I could welcome the present cold snap. With Christmas but three weeks ahead, it is seasonable to see the hoar frost on the bushes and trees, turning familiar spots into scenes upon which one may gaze as though on a new land. This morning the air was clear and brisk. The golden light from the rising sun was reflected from the rime on every twig until the whole was a-glitter. It was the sort of morning when one has a distinct inclination to curtail the early splash, or even not to splash at all, but to compromise with a jug of water drawn from the tap that has direct communication with the kitchen boiler.

The breakfast room is cosy with its hour-old fire, the toast is cooling in the rack, and from somewhere which is prohibited area to the king of the castle comes the appetising smell of frizzling bacon. All very nice and comfortable and comforting and enervating to the man in the early forties, who may soon have to get into training to follow on the heels of those who have already crossed the silver streak into a land of hardship. For England is getting ready to start fighting, and none may tell to what extent the age limit may be extended, even if there be a limit fixed that shall be mentioned in figures. It is possible that the limit may be one of bodily fitness, with age hardly considered. Soon some of us may have other reasons to know that England is at war, besides the grumblings from the kitchen about the scarcity of sugar.

This morning the aeroplanes were sailing overhead. Mornings have passed, misty, foggy mornings, when flying was an impossibility, and this morning the machines were roaring around, frisking in the early sunshine, their pilots putting them through all the evolutions at command as though it were a treat to be alive and get away up into the clear air for a kick and a gambol.

And I wondered whether the pilots were cold. Whether up there in the frosty morning air, through which they were being whisked at 80 miles or more an hour, it was not eating into their very bones, and freezing them stiff. It is cold, doubtlessly, but I have seen pilots descend from these jaunts into the upper air, and spring from their machines with rosy faces and smiling lips. It is cold without a doubt. Should you ask one of these flyers, he will tell you so, probably with a suitable adjective attached, but he will rub his hands and stamp his feet, and then peel off his greatcoat and tuck it under his arm.

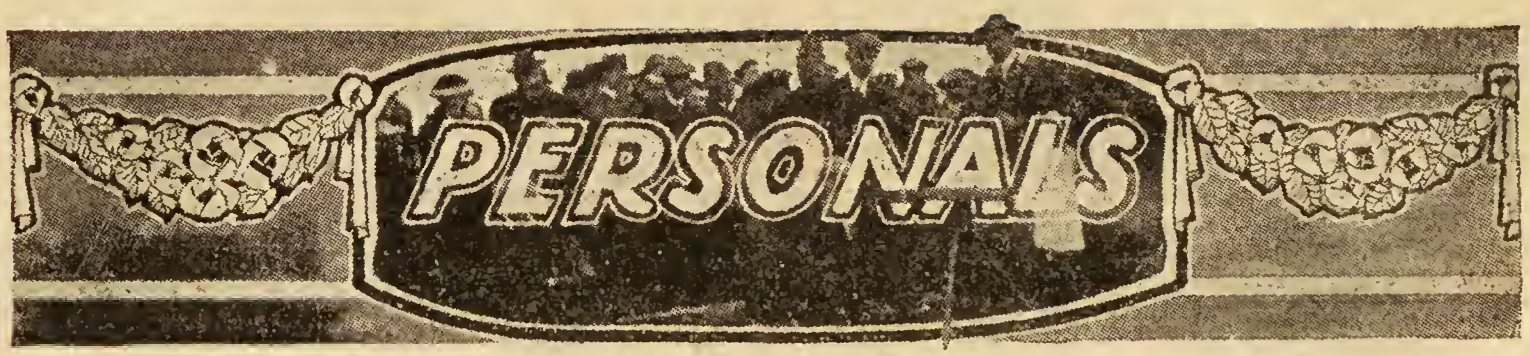
I doubt whether any one of those far above my house this morning was anything like as cold as I was during the few moments I stood in my garden to watch them, and I wondered why, with a fairly good guess at the answer.

Talking the matter over in the train, from the windows of which we could still see some machines circling above, my usual travelling companion admitted that pilots did not feel the cold as we did because they were used to it, but could not be brought to see that it would be a great deal better for many more of us if we could get used to it, or in other words, become more healthy.

Fact of the matter is, there is too much indolence. Too much of standing astride the hearthrug. Too much rushing from warm rooms into warm trains, and from warm trains into warm offices. I have known people, although you may not believe it, who every winter have pasted strips of paper round the window frames, yet those nearly dead with consumption can sleep out on the open verandas of hospitals.

Of course all this must lead up to a yarn. I knew a man who was always getting bitten by the microbe responsible for new ideas. Ordinarily, he was a respectable citizen of normal habits, but when the germ of any new crank idea got into his brain, he would go for it hot-foot. The first symptoms of his lapse from the path of sanity were heralded by his suddenly found conviction that a hat was an absurd innovation of human foolishness. Winter put a time limit on his idea that nature sent us into this world exactly as we were intended to dress, and he argued that in any other country but this it would have been all right, but that here we must take artificial means to protect ourselves. This period embraced double underclothing, bodybelts, knitted waistcoats, overshoes, and somebody's malted extract of oil taken three times a day At times he was a vegetarian. His family had a lovely time, for like all converts to anything new, he must take all along with him. Finally he got the idea that they should all sleep in tents in the garden. One night was sufficient for his wife to present her ultimatum so far as she and the children were concerned, but he stuck to it for nearly a week, and would probably have continued right through the winter except for the fact that he was in his proper bed when the doctor came, and by the time he got well enough to think of anything in particular, he was off on a new stunt. I knew another man who before the war filled himself half full of medicine every winter morning, and wore clothing enough for three. Joining the G.R.s early after their creation, he has passed two years of hard training, including sentry go half the nights in the week, bucked up by trench digging every Sunday. I saw him yesterday looking the picture of health. He has put on weight, never wears a topcoat except his uniform one when on duty. He works from 10 to 12 hours every day in the city, and when I saw him outside the Royal Exchange he laughed at me for saying it was cold.

And of course all this should lead up to a moral, but as it might not adorn a tale I will not point it —unless I have already done so.



PERSONALS

Casualties.

Lieutenant George Lushington Colomb, London Regiment and R.F.C., killed in action on November 22nd, was the second and only surviving child of Mrs. Maud Colomb and the late William R. Colomb, of Rossleigh, Greystones, Ireland. He and his elder brother, Mervyn, were educated at Haileybury, and both enlisted in the London Regiment on the outbreak of the war. They fought as non-commissioned officers at Ypres and at Neuve Chapelle, where they were wounded. The elder brother, who had just received his commission, died of his wounds. Lieutenant George Colomb received the D.S.M. for his gallantry in rescuing wounded comrades, and his commission. After serving some time with the depôt at home, he joined the R.F.C., and had been five weeks at the Front and had taken part in one successful engagement when his machine met with the accident which caused his death at the age of 29.

Lieutenant E. H. Hall, Duke of Cornwall's Light Infantry, attached R.F.C., killed accidentally on November 27th whilst flying, was the eldest son of Mr. and Mrs. Percy H. Hall, of Caterham, Surrey. He was aged 24.

Captain C. E. P. Henderson, Royal Field Artillery (killed in action on November 17th, while commanding his battery), was twenty-nine years of age, and was educated at Radley and Woolwich, entering the Royal Artillery in 1906. Captain Henderson was a balloonist, French interpreter, and held the Royal Aero Club certificate. He served in France from September, 1914, until his death, and was present at the battles of the Aisne, the Marne, Ypres, and La Bassée, and along the line to Vermelles, Loos, Hulluch, and Hohenzollern, commanding his battery at the last three battles and receiving the Cross of the Legion of Honour. He commanded his battery again right through the Somme Battle, and his name was sent up three times this year for the M.C.

Second Lieutenant Ernest Stanley Patrick Hynes, R.F.C., killed on November 10th, aged 18, as the result of an accident while flying on duty, was the youngest son of Mr. H. H. Hynes and the late Mrs. Hynes, of Penmorvah, Penzance. He was educated at Rosslyn House and Price's School, Fareham, and entered the R.F.C. through Sandhurst, being gazetted to the Buffs. He left for the Front on September 20th last.

Lieutenant J. M. J. Kenny, R.F.C. (killed in action on September 23rd), was twenty years of age, and son of the late Patrick J. Kenny, solicitor, Waterford. He had a commission in the Army Service Corps in April, 1915, and, transferring to the Royal Flying Corps, was gazetted flying officer in the September following; he was promoted in May of this year.

Sub-Lieutenant Alfred Robert Knight, R.N.V.R., killed on November 13th, was formerly in the Armoured Car Section of the R.N.A.S., but was transferred to the R.N.D. Before the outbreak of war he was a member of the staff of the Bank of Montreal, London. The only child of Mr. Knight, Ashford, Kent, he was educated at the Grammar School, Ashford.

Second Lieutenant Andrew C. Laird, the Black Watch and R.F.C., killed, was the youngest son of Mr. and Mrs. John Laird, of Balmoral Place, Crosshill, Glasgow, and was 22 years of age. He joined the Glasgow Highlanders at the outbreak of war, received a commission in the Black Watch in June, 1915, and was transferred to the R.F.C. in August, 1916. Before the war he was employed by John Laird and Sons, Ltd., wholesale stationers, Glasgow.

News has been received of the death of Captain Robert John Lillywhite, R.F.C., in an aeroplane accident at the Front, at the age of 23. He was a nephew of Lillywhite, the famous Sussex cricketer, and his father was for many years in the service of the Duke of Richmond, on his West Sussex estate. He originally entered the Navy, but was discharged for medical reasons. Taking up aviation, he was one of the first to obtain a pilot's certificate under the new rules. Engaged as flying instructor in the R.F.C., he served in Egypt, and in 1915 was transferred to another front, where he obtained a Lieutenant's commission. Injured in a motor accident early in this year, he returned home to recuperate. During this period he carried out duties as inspector of aerodromes and lecturer. In September he was promoted Captain.

Second Lieutenant Christopher Monckton, Royal Irish Fusiliers, attached R.F.C., previously unofficially, now officially, reported killed, was the elder son of Mr. Arthur Monckton, J.P., Normanston Hall, Oulton, Lowestoft, and a grandson of the fourth Earl of Radnor. He joined the 3rd Battalion Princess Victoria's at Buncrana in September, 1915.

Missing.

Lieutenant Trevor Moutray Bennet, M.C., Royal Irish Rifles, attached R.F.C., who is officially reported missing, is a son of Mr. James Bennet, University Road, Belfast. He was educated at the Royal Belfast Academical Institution, and was a member of the Ulster Volunteer Force.

Captain Sidney Edward Cowan, M.C., R.F.C., Special Reserve, reported missing, is a son of Mr. P. C. Cowan, D.Sc., M.Inst.C.E., Chief Engineering Inspector of the Local Government Board. Captain Cowan, who is 19 years of age, was born at Downpatrick.

Major Lanoe George Hawker, V.C., D.S.O., Royal Engineers, attached R.F.C., reported missing, is a son of the late Lieutenant H. C. Hawker, R.N., of Home Croft, Longparish, Hants, and was born in 1890. He was educated at the Royal Naval College, Dartmouth, and the Royal Military Academy, Woolwich, and entered the Royal Engineers in 1911. During the present war he has acted as Flight-Commander of the R.F.C., and has received mention in despatches, as well as the D.S.O. and the V.C. Major Hawker won the Victoria Cross on July 25th, 1915. The official record of his deed is as follows: "When flying alone he attacked three German aeroplanes in succession. The first managed eventually to escape, the second was driven to ground damaged, and the third, which he attacked at a height of about 10,000 ft., was driven to earth in our lines, the pilot and observer being killed. The personal bravery shown by this officer was of the very highest order, as the enemy's aircraft were armed with machine guns, and all carried a passenger as well as the pilot." The D.S.O. was conferred upon Major (then Lieutenant) Hawker for an exploit of which the following is the official record: "For conspicuous gallantry on April 17th, 1915, when he succeeded in dropping bombs on the German airshed at Gontrode from a height of only 200 ft. under circumstances of the greatest risk. Lieutenant Hawker displayed remarkable ingenuity in utilising an occupied German captive balloon to shield him from fire whilst manœuvring to drop the bombs."

Married and to be Married.

The marriage arranged between Flight-Commander J. H. Lidderdale, R.N., and Maud, youngest daughter of Mr. and Mrs. J. Hanson Walker, 2, Queen's Elm Square, Chelsea, will take place on Saturday, December 16th, at St. Peter's, Cranley Gardens, at 2.30.

An engagement is announced between Second Lieutenant Austin E. Neal, R.F.C., son of the late Mr. Thomas Neal, of Spondon, Derby, and Millicent Gertrude, only daughter of Mr. H. A. Couchman, Shobnall Grange, Burton-on-Trent.

An engagement is announced between Flight-Lieutenant J. Forgan Potts, R.N., son of Captain and Mrs. W. F. Potts, of Bombay, and Lucette, daughter of Commander

Bultinck, delegate of the Belgian Minister of Marine in London, and of Madame A. Bultinck, 67, Onslow Gardens, South Kensington.

The marriage arranged between Captain Alister F. Keble White, Suffolk Regiment and R.F.C., eldest son of the Rev. A. and Mrs. Keble White, of Chevington, Suffolk, and Doris Freda, only daughter of Lieutenant-Colonel W. T. Pretty, T.D., D.L., and Mrs. Pretty, of Goldrood, Ipswich, will take place quietly at St. Mary Stoke, Ipswich, on December 20th, at a quarter-past two o'clock.

Items.

Flight Sub-Lieutenant Pulling, who has been decorated in connection with the Zeppelin fight on the Norfolk coast, is an old boy of St. Anne's, Redhill. He is Devonshire born, and before receiving his commission in August last year was in the Government wireless service.

Lieutenant Egbert Cadbury, also honoured in the same cause, is 23 years old. At the outbreak of war he left Trinity College, Cambridge, where he was studying for the law, and joined the crew of the "Zarifa" as an A.B., the "Zarifa" being a converted yacht manned mostly by Cambridge men. After nearly a year at sea he entered the R.N.A.S., gained his pilot's certificate, and has been stationed on the East Coast for nearly eighteen months. Lieutenant Cadbury is the youngest son of Mr. George Cadbury, chairman of Messrs. Cadbury Bros., Ltd., of Bournville, Birmingham. Mr. George Cadbury, it will be remembered, acquired the *Daily News*, but some years ago disposed of his shares and retired from the board of directors. Two of his sons, brothers of Lieutenant Egbert Cadbury, are, however, actively engaged in the management of both the *Daily News* and the *Star*.

Flight Sub-Lieutenant Fane, who also receives an award, joined the R.N.A.S. on July 22nd of last year. He is 19 years of age, and entered the service straight from Charterhouse. He has done a great deal of flying, and his ability and capacity soon stamped him as a daring pilot.

Captain G. L. Watson, R.F.C., who was the observer with Lieutenant Roberts when the latter's machine, having had its controls shot away, made a spiral nose dive from 8,000 feet, is now in a London hospital recovering from a fractured ankle and a scalp wound, a German bullet having grazed his temple.

The will of Major Herbert Phillips Fletcher, F.R.I.B.A., F.S.I., A.M.I.C.E., attached R.F.C., of New Bridge Street, E.C., and Park House, Marden, Kent, who died on August 3rd, aged 44, from an accident on duty, son of the late Professor Banister Fletcher, at one time M.P. for North-West Wilts, has been proved at £17,077.

AVIATION IN PARLIAMENT.

Orders for Naval Aeroplanes.

Mr. Joynson-Hicks, in the House of Commons on November 29th, asked the First Lord of the Admiralty—(1) what are the patent rights and other matters which he has learnt are included in the 16 per cent. commission paid by certain American companies to an English barrister for influencing or securing the Admiralty orders for their aeroplanes; and (2) whether any members of his staff acted in any manner as introducer or intermediary between the English barrister acting as agent for an American aeroplane company; and whether he will inquire fully into the ultimate distribution of the sums involved?

Dr. Macnamara: The answer to the first part of Question 7 is in the negative. As regards the other matters referred to in the questions, I do not think I can profitably deal with them until the Admiralty have full information before them as a result of the inquiries now being carried out in the United States. I have already given my hon. friend an assurance that the inquiry already initiated will be full and searching, and I hope he will be prepared to leave the matter at that for the time being.

Mr. Ashley: Will the inquiry include a specific investigation into the prices paid?

Dr. Macnamara: Yes; I said last week that we would go fully into the whole contract.

The Royal Naval Air Service.

Mr. Joynson-Hicks also asked the First Lord of the Admiralty what proportion of the 95·1 per cent. of the Royal Naval Air Service who are not pilots are serving at home; and what percentage of the officers and men so serving at home are of military age?

Dr. Macnamara: 75 per cent. of the Royal Naval Air Service personnel—excluding pilots—are serving at home. My hon. friend will, of course, be aware that there are many duties which render this necessary. The handling of airships demands a considerable proportion of men per pilot. Then there are mechanics and men engaged on transport and administration work, officers and men engaged on instructional work, and those also employed in connection with experimental gunnery and flying work; and, finally, there is, as my hon. friend knows, a proportion of the personnel employed on coast and sea patrol work. The exact percentage of the officers and men so serving who are of military age cannot be ascertained without a large amount of clerical labour, but it has been estimated for me that about 90 per cent. come within this category.

Mr. Joynson-Hicks: Could not many of the men engaged in clerical work, and some of the control men, be replaced by older men, so that the men of military age might be released for active service?

Dr. Macnamara: In regard to the clerical staff, it has been recently examined, and as to the other part of the question, I will put the point before the responsible authorities.

Mr. Joynson-Hicks asked the First Lord of the Admiralty whether No. 3 Wing of the Royal Naval Air Service, numerically the largest wing of the Royal Naval Air Service, was sent by the Admiralty to its present position on the Continent, where it has been quartered since July, without application for either their presence or their services by Sir Douglas Haig or the general commanding the Royal Flying Corps; and whether either of these officers has the right to call on such wing for help if needed? If the right hon. gentleman feels that to answer this question would not be in the national interest, I do not want it answered.

An Hon. Member: You ought to have thought of that before you put it down.

Mr. Balfour: The force in question was sent in answer to a request from the French military authorities, with whom it is at present serving, and who are, I believe, much satisfied with its performance. It does not operate in the vicinity of the British line, nor is it under the British General Headquarters. But, of course, it forms part of the general forces of the Crown which can be used by the Government wherever they are most needed.

The Bombing of Zeebrugge.

Mr. Billing asked the First Lord of the Admiralty the date when the first Naval Air Squadron was sent to Dunkirk; the date that the order was issued forbidding them to drop bombs on Zeebrugge and district; the reason why such an order was given; whether the Admiralty received application or applications from commanding officers in Dunkirk and district for permission to bombard Zeebrugge and district; the date that such permission was eventually granted; and whether the recent raids have been successful?

Dr. Macnamara: My right hon. friend regrets that questions of this character, dealing with operations, should have been placed upon the Order Paper. The operations referred to are under the control of the Vice-Admiral Commanding, in whose discretion the Admiralty has complete confidence. If the question is intended to convey the impression that either the Vice-Admiral or the Admiralty is not equally determined with my hon. friend to harry the enemy whenever we can do so with profit, I can only assure him that he is much mistaken.

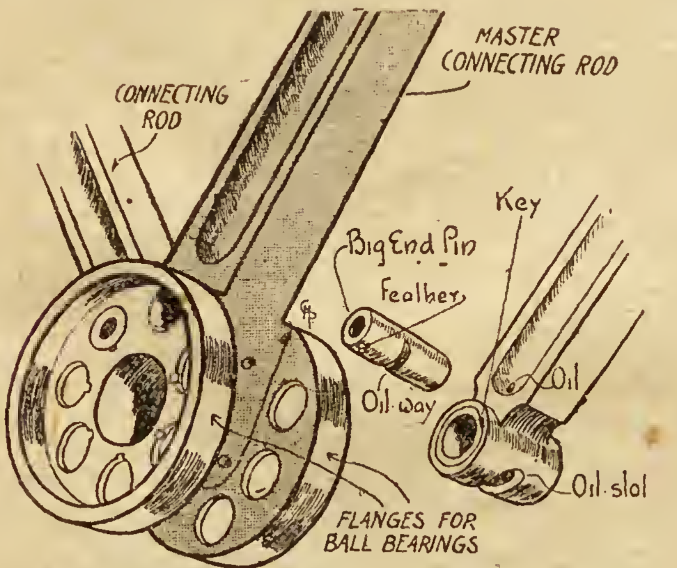
Mr. Billing: Has it come to the right hon. gentleman's notice that the bombing raids on Zeebrugge were stopped for a considerable period, and that they were not renewed until there was a great agitation in the Press and a certain Sea Lord wrote to Admiral Bacon and told him he had better do so?

Dr. Macnamara: I regret to say that is the substance of the question, on which, on behalf of my right hon. friend, I say that it was not desirable to place it upon the Paper. If my hon. friend has any views on the matter, all he has to do is to come and submit them to me.

ANSWERS TO CORRESPONDENTS.

K. H. F. (Birmingham).

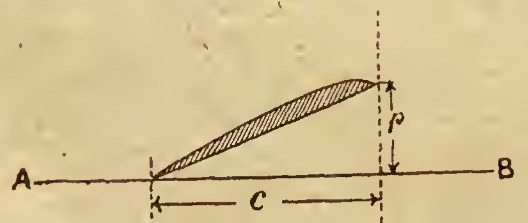
No, the Anzani is not a rotary engine, although its cylinders are disposed in the same fashion as those of rotary engines. It belongs to the type known as radial engines, in which the cylinders are held stationary, while the shaft revolves. The object of providing slots in the sides of the machine you mention is probably to admit a certain amount of air to the engine housing, or else to allow the air passing through the radiator to escape. The louvres, or slots, will probably be found to have lips turned forward or backward according to whether their purpose is the former or latter. Practice differs somewhat in regard to the attachment of connecting rods to crank shaft of rotary engines. We illustrate one method, that employed in the Gnome engines. One of the connecting rods, which is generally termed the master connecting rod, has turned on its big end two flanges into which ball races fit. These flanges are provided with holes for the big end pins of the other connecting rods, the number of holes depending, of course, on the number of cylinders of the engine. The big end pins are feathered to prevent them from turning in the master rod, the bearing being formed between the pins and the big ends of the ordinary connecting rods. We trust our sketch will illustrate the attachment sufficiently clearly.



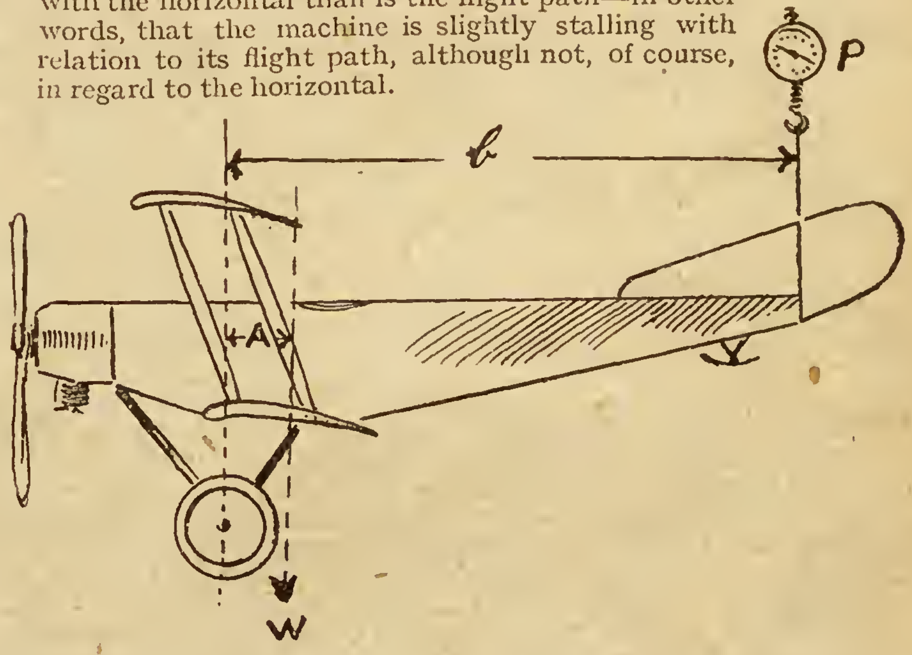
Details of the Master Connecting Rod + Big End.

L. J. P. (R.N.A.S.).

The pitch of an airscrew can be found in the following manner: Place the airscrew on a plane surface, such as a table top, with the driving face downward. The distance C, or the projected width of the blade, is a part of the circumference at the point measured, and the height p of the leading edge of the section above the base line is part of the pitch. The pitch is then found by the formula $P = \frac{2\pi r p}{C}$, where P = pitch, in inches, r = the distance from the axis of the boss to the point measured, in inches, and C = the projected blade width, in inches, π, of course, $= 3{\cdot}1416$.



By angle of incidence is meant the angle which the chord of the wing section makes with the relative wind. If a machine is flying horizontal, that is to say neither rising nor falling, with its longitudinal axis horizontal, and the wing chords make an angle of 3 degrees with the longitudinal axis, then, of course, the incidence is 3 degrees. If, however, the machine is tilted with its longitudinal axis at an angle of 10 degrees to the horizontal, it does not necessarily follow that the angle which the chord makes with the relative wind is still 3 degrees. Thus, if the machine is tilted for climbing as mentioned above, but its engine throttled down until the machine can only manage to stagger along on a horizontal flight path in spite of the tilt, then obviously the incidence is 10 + 3 = 13 degrees. In a steep climb it is doubtful if the majority of machines really fly with their longitudinal axis parallel to the flight path. It is much more likely that, as a matter of fact, the longitudinal axis is at a greater angle with the horizontal than is the flight path—in other words, that the machine is slightly stalling with relation to its flight path, although not, of course, in regard to the horizontal.



If it is desired to find the centre of gravity of a machine, and no sufficiently strong scales are at hand which would support the weight of the whole machine, the centre of gravity can be found by the aid of much weaker scales, if the weight of the machine is known. Suppose, for instance, that the weight of a machine is 1,500 lbs., fully loaded, and that its tail is lifted off the ground by a wire attached to a spring scales, while the wheels are resting on the ground. If the distance of the point of attachment of the scale rope from the wheel centres is 15 ft., and the pull on the scales is 100 lbs., then the distance A from the wheel centres to the centre of gravity is $= \frac{100 \times 15}{1500} = 1$ ft. To generalise, the formula is $A = \frac{Pb}{W}$. The slip ratio of a propeller is frequently expressed as $\frac{(p \times r) - V}{p \times r}$, where p = pitch of propeller, in ft., r = revolutions per second, and V = the axial advance of the propeller, that is to say, the speed of the machine, in ft. per second.

P. B. (Desborough).

We believe you can still enlist in the R.N.A.S. for the duration of the war. Apply to the R.N.A.S. Recruiting Station, Brook Green, Hammersmith, W. You could hardly do better than study "Burl's Aero Engines," which can be obtained for 8*s.* 10*d.* post free from "Flight" offices. Any time spent in working in a motor garage would give you experience which should prove helpful.

R. A. B. (Rock Ferry).

1. As arranged. 2. You should apply to Adastral House for the particulars. 3. The pay of officers in the R.F.C. is set out on p. 984 of "Flight" for November 9th.

DYNAMICAL STABILITY OF AEROPLANES.[*]

By JEROME C. HUNSAKER.

Nature of Thesis.

The writer's thesis under the title here given, of which the following is an abstract, is the result of some three years' work in applied aerodynamics while detailed by the Secretary of the Navy to the Massachusetts Institute of Technology. The preliminary work of erecting the wind tunnel and aerodynamical balance, design and calibration of instruments for velocity measurement, establishment of standard methods of expermentation and, finally, the investigation of the force of the wind upon aeroplane wings, rudders, bodies, and other parts has been fully described elsewhere.[†] Study of aeroplane parts led naturally to the study of the aerodynamical properties of complete model aeroplanes which forms the substance of this thesis, the objects of which were :—

1. To determine the aerodynamical constants for two aeroplanes by means of model tests in the wind tunnel. One aeroplane was a standard military tractor with no claims to inherent stability in flight, the other machine designed to possess some degree of inherent stability while departing as little as possible from standard practice as exemplified by the other.
2. To apply the aerodynamical constants so found in the dynamical equations of motion for the full scale aeroplanes in free flight, and to examine the stability of the motion by the method of small oscillations, as first applied to the aeroplane by Bryan [‡] and later extended by Bairstow.[§]
3. To compare the stability both laterally and longitudinally of the two aeroplane types chosen, with a view to tracing to the individual parts of each machine their effects upon the motion.
4. To attempt to formulate general qualitative conclusions which may assist aeroplane constructors to avoid instability or to provide a degree of stability.
5. To throw light upon the general problem of inherent dynamical stability.

Previous Work.

The first rational theory of the dynamical stability of aeroplanes is due to Bryan, whose work was extended and applied by Bairstow with wind tunnel tests. The late E. T. Busk, of the Physical Staff of the Royal Aircraft Factory, England, applied Bairstow's model tests to an actual aeroplane, and recently succeeded in perfecting an inherently stable aeroplane which could be flown " hands off." Neither the details of Busk's experiments nor of the type of aeroplane developed by him have been disclosed by the British War Office, for obvious reasons.

Theoretical aspects of the problem have been discussed by Lanchester, Riessner, Crocco, Bothezat, and others, but the only applications are those of Bairstow and Busk.

Laboratary Work.

Wind tunnel testing of the models under investigation was carried on from June to September, 1915, by the writer and various students under his direction. The mathematical portions of the work were completed during the period October, 1915–March, 1916, with frequent consultation with Professor E. B. Wilson of the Department of Mathematics.

General Problem of Stability.

The stable aeroplane model we designate by S and the unstable aeroplane by U. Both were tested in the same manner. The models were $\frac{1}{24}$ scale, giving a span of about 18 ins. The wind tunnel has a section of 16 sq. ft., and from previous tests it was concluded that the influence of the walls was negligible for models of this size.

The application of model experiments to predict the aerodynamical properties of a full-size aeroplane is well understood, and the validity of such application has been repeatedly demonstrated. We assume that aerodynamical forces vary as the density of the air, as the square of a linear dimension of the model, and as the square of the relative velocity. This is strictly true for inertia and eddy-making resistance, but not quite true for skin friction, which varies less rapidly than the " square law," and must depend somewhat on the viscosity of the air. However, for engineering purposes, it is usual and probably sufficiently exact to assume the " square law " for all resistances.

The investigation is most conveniently discussed in two parts, the first dealing with the longitudinal motion involving pitching of the aeroplane and rising and sinking of its centre of gravity combined with change of forward speed, and the second, with the lateral motion, which involves side-slipping, or skidding, combined with rolling and yawing to right and left.

Stability is distinguished as statical or dynamical. An aeroplane in free flight in still air must be driven at such a speed and kept at such an inclination of wings to wind that the weight is just sustained. The maintenance of this normal attitude is the technique of the aviator. When in its normal attitude the aeroplane, if properly balanced, is in equilibrum. In a statical sense, this equilibrium is stable if righting moments are called into play tending to return the aeroplane to its normal attitude if by any cause it is deviated therefrom. In general an aeroplane, if stable in a statical sense, will, when given an initial deviation, take up an oscillation which either may be damped out or may increase in amplitude. The aeroplane is dynamically stable if, and only if, these oscillations die out as time goes on, leaving the aeroplane in its original normal attitude. It is clear that statical stability must first be provided before the dynamical stability of a design can be examined. Also, without statical stability, there can be no dynamical stability inherent in the aeroplane.

Longitudinal Tests.

The aeroplane model was mounted in the wind tunnel, and the position, magnitude and direction of the resultant wind force determined for a series of altitudes in pitch corresponding to the highest and lowest flight velocities of the full scale aeroplane. This resultant force was then resolved into a couple acting at the centre of gravity and two component forces acting vertically and horizontally. From a consideration of the variation of vertical force or lift with change of angle, the corresponding speeds necessary to sustain the weight were estimated. Likewise, the equilibrium of the aeroplane was adjusted to be statically stable by change in horizontal tail surfaces. After three trials a tail setting was found which gave a proper balance.

With this disposition of surfaces, the rate of change of the component forces and of the couple was computed for use in the equations of motion. The radius of gyration of the aeroplane was estimated from the plans and the damping coefficient obtained by oscillating the model in pitch.

For the better measurement, the model was mounted on a rocker arm made to oscillate by powerful spiral springs. The decrement of amplitude for various wind speeds was a measure of the damping of the pitching motion due to the air. Correction made for the damping due to pivot friction and to the wind on the bare apparatus, the logarithmic decrement was found to vary very nearly as the first power of the velocity as must be expected.

Longitudinal Motion.

The equations of motion for the full scale aeroplane were then written down and the aerodynamical coefficients substituted. Confining the discussion to small oscillations about the equilibrium position, the longitudinal motion is represented by three simultaneous linear differential equations with constant coefficients of a well-known type.

Solution by means of approximate factors shows that the motion may be considered as composed of two oscillations; one of a period of the order of two seconds damped to half amplitude in 0·1 second, the other of period from 10 to 30 seconds not very strongly damped.

From a consideration of the coefficients, the short oscillation appears never to be of importance on ordinary aeroplanes, but the long oscillation, being only moderately damped, may cause trouble, especially for an aeroplane that flies with a large angle of incidence for the wings.

The calculation of the period and damping of the long oscillation was repeated for several speeds from highest to lowest corresponding to small and large angles of incidence with the results shown in the following table :—

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[*] Abstract of a thesis submitted to the Faculty of the Massachusetts Institute of Technology in partial fulfilment of the requirements for the Degree of Doctor of Engineering.

[†] " Reports on Wind Tunnel Experiments in Aerodynamics," "Smithsonian Institution," Publication 2,368, Washington, January 15th, 1916; "Stable Biplanes," *Engineering*, London, January 7th, and 14th, 1916.

[‡] G. H. Bryan, " Stability in Aviation."

[§] " Technical Report of the Advisory Committee for Aeronautics," London. 1912–13.

Aeroplane... ...	S.	S.	S.	S.	U.	U.	U.	U.
Velocity ... miles-hour	76·9	53·4	44·6	36·9	79	51·8	47	44·2
Incidence of wings ...	0°	3°	6°	12°	1°	7°	10°	14°
Period ... ... secs.	34·7	17·6	15·8	10·56	34·0	16·7	13·7	11·5
Damp 50 per cent. secs.	8·1	11·0	13·1	—	11·0	17·7	63·0	—
Double amplitude secs.	—	—	—	24·7	—	—	—	24·7

Instability at Low Speed.

It appears that the period becomes much more rapid at low speed, that at some critical speed the damping vanishes, and below this speed both aeroplanes become frankly unstable. This instability at extreme low speed is common to all aeroplanes, and the only advantage of our "stable" aeroplane S is that its longitudinal motion is stable down to about 40 miles per hour, while aerolpane U is stable only down to about 47 miles per hour.

The necessary existence of a critical velocity for any aeroplane where the longitudinal stability is believed to be shown here for the first time.

A study of the relative magnitudes of the coefficients for these typical aeroplanes leads to the conclusion that longitudinal instability at low speed is due, first to the decrease in damping of the tail surfaces on account of the low speed, and, secondly, to the decrease in rate of change of lifting force with change in attitude for high angles of incidence. Ordinarily, if an aeroplane heads up, the increased angle of incidence of the wings causes increased lift and the aeroplane rises, and *vice versa.*

However, for an angle of about 15°, all known aeroplane wings reach a maximum lift, and any further increase in incidence causes no increase in lift. This is a critical attitude for the wings. If an aeroplane flies very slowly it must be held at some large angle near this critical angle. If the machine is headed up, giving a greater angle of incidence, it will obtain from the air no greater lift and will not rise. It is "stalled." Indeed, some wings show a marked drop in lift for angles beyond the critical angle.

The coefficient that represents the rate of change of lift with angle of incidence is the predominating term in the expression which represents the damping of the long oscillation, and this coefficient vanishes near the critical angle. Consequently, if an aeroplane is to be stable and land at a relatively slow speed, it must not operate at too great an angle of incidence. To sustain its weight it should therefore have a greater wing area than another aeroplane which lands with about the critical angle for the wings.

The principal difference between aeroplanes S and U is that the former supports a weight of 3·55 pounds per square foot of wing area and the latter 5·2 pounds per square foot.

The following recommendations are made for an aeroplane to have its longitudinal motion damped at lower speeds than is usual in practice :—

1. Provide large horizontal surfaces of long arm for damping the pitching.
2. Provide wings of such area that the slow speed does not require a great angle of incidence. Roughly, the safe slow speed should not require more than 80 per cent. of the maximum lift of the wings.
3. Keep the longitudinal radius of gyration small by concentrating the principal weights.

Slowness in Pitching.

It may be imagined that a dynamically stable aeroplane of rapid period might be so violent in its motion that the pilot would be shaken about to such an extent as to be hindered in the performance of his military duties of observation, gunfire, or bomb dropping. It appears that the expression representing the period of the long oscillation contains certain predominating coefficients, and a consideration of their magnitude leads to the following conclusions :—

The natural period of pitching is increased by :

1. High speed of flight.
2. Large damping surfaces on the tail.
3. Small angle of incidence.
4. Small righting moments.

The righting moments which tend to restore the aeroplane to its normal attitude when it pitches are a measure of statical stability. If the statical stability is great the period of the oscillation will be short and the motion violent. Our desire is an aeroplane that has a gentle motion of slow period heavily damped. Dynamical stability is better given by heavy damping than by excessive stiffness or statical stability.

An ocean liner of too great stiffness (large metacentric height) is not suitable for passenger or cattle carrying service ; it is preferable in ship design to give only enough metacentric height to insure that the vessel is never unstable, and to damp the roll by generous bilge keels.

In a similar manner in aeroplane design, the theory indicates that it is preferable to give just enough statical stability to insure that the aeroplane is never unstable and to make the oscillation dynamically stable by the use of generous damping surface and large wings.

These remarks on damping *versus* stiffness apply with equal force to the lateral motion of the aeroplane, which is the subject of the second part of the thesis.

Lateral Motion.

In a given longitudinal attitude proper for some fixed speed the aeroplane model was tested in the wind tunnel when turned to right and left away from the symmetrical position. For these oblique positions we measured the moment tending to turn the model back into the wind ("yawing" moment), the moment tending to tilt it over laterally ("banking" or rolling moment), and the transverse force tending to push the model to one side. From a series of such measurements the rate of change of yawing moment, rolling moment and lateral force with angle of yaw were estimated.

In the asymmetrical or lateral motion of the aeroplane in flight the angular velocity in roll or yaw is considerably damped by surfaces moving through the air. Consequently it was necessary to obtain damping coefficients for rolling and yawing from model tests on the oscillating beam in a manner similar to that employed to measure the damping of pitching.

When an aeroplane yaws rapidly the more rapidly moving wing lifts more than the other and a rolling moment is produced. Also when an aeroplane rolls, the downward moving wing has a greater angle of incidence than the other, and, therefore, has more resistance to forward motion, producing a yawing moment. A method for calculating the rolling moment due to yawing and the yawing moment due to rolling has been devised.

The necessary aerodynamical coefficients being now at hand, and the radii of gyration in roll and yaw, the equations of motion for the asymmetrical motion may be set down. For small oscillations, these reduce to three linear differential equations with constant coefficients. The detriment formed from the coefficients may be factored by use of approximate methods, and the motion compounded from that represented by each of three factors.

(*To be concluded.*)

* * *

Air Raids on Bucharest.

Writing from the Roumanian capital on November 22nd, the *Times* correspondent says :—

"In the message from the Pope received by Queen Marie after the recent air raids, His Holiness congratulated the Queen on her escape from the attacks by the German airmen. This significant message on the part of the head of the Roman Catholic Church to the Sovereign of another communion constitutes an open and public rebuke to the authors' policy of 'frightfulness,' such as it has never yet received, exposing them to the reprobation of the whole civilized world and the condemnation of history.

"To-day's attack lasted for two hours, a great number of bombs being thrown. French and British aircraft were engaged in the defence and several aerial duels took place."

Writing on the following day he says that Rymnik Sarat, in Eastern Roumania, is the latest place to be bombed.

Bombs on Refugees.

Reports received in Petrograd from Kieff on November 30th, stated that enemy aeroplanes are mercilessly harrying refugees on all the roads from Bucharest and towns of Western Roumania, dropping bombs on them and firing att hem with machine guns.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *General Headquarters, November 28th, 10.30 p.m.*

"In aerial combats one hostile aeroplane was destroyed, and one driven down damaged. Two of our machines are missing."

Admiralty, November 29th.

"During the course of yesterday afternoon (28th inst.) an attack was carried out by naval aeroplanes upon the harbour at Zeebrugge, but owing to weather results could not be observed. All machines returned safely."

Admiralty, November 30th.

"The following operations have been carried out by squadrons of naval aeroplanes operating against the Bulgarian coast between November 23rd and November 28th:—

"Nov. 23rd.—A bomb attack was carried out on Karjani.

"Nov. 24th.—The railway station at Angista and stores in the vicinity were bombed, a direct hit being obtained on the station itself. On the same day an enemy camp near Razolivos was bombed, and the enemy swept with machine-gun fire.

"Nov. 25th.—An attack was carried out on the enemy aerodrome at Drama, and considerable damage was done.

"Nov. 26th.—Further bomb attacks were carried out in the Drama area and at Angista.

"Nov. 27th.—Porna and Doksambos were attacked.

"Nov. 28th.—Drama aerodrome and railway station were again attacked, with very satisfactory results. All our machines returned safely."

Admiralty, December 2nd.

"On Nov. 29th a squadron of British naval aeroplanes operating against the Bulgarian coast, attacked the enemy seaplane base at Gereviz, effecting great damage.

"On Nov. 30th a bomb attack was carried out on Doksambos, and on the same day a troop train near Porna was attacked by two aeroplanes. The men in charge of the engine were wounded and fell out, the train itself proceeding at a high speed with no one in charge."

War Office, December 3rd.

"*Salonica.*—The enemy's camp near Seres was bombed by our aeroplanes and serious damage inflicted."

French. *Paris, November 30th.*

"It is confirmed that on Nov. 23rd at one o'clock in the afternoon Sub-Lieutenant Nungesser brought down his eighteenth aeroplane. The enemy machine was dashed to pieces on the ground near Falvy (Somme region).

"*Salonica.*—Our aircraft dropped many bombs on Prilep."

Paris, December 1st.

"The factories of Thionville and some bivouacs in the region of Damvillers were bombarded last evening by our aircraft.

"*Salonica.*—Prilep has been bombed by our aircraft."

Paris, December 2nd.

"Last night one of our aeroplanes dropped nine bombs of 120 millimetres on the railway station of Spincourt and three of the same calibre on enemy contonments and Billy-sur-Largrennes."

Paris, December 3rd.

"Between 5.50 p.m. and 10 p.m. on the night of Dec. 2nd–3rd, seven aeroplanes dropped 720 kilogrammes of projectiles on the factories of Thionville and on the enemy's aviation hangars and cantonments at Etain."

Italian. *Rome, November 30th.*

"Hostile aircraft attempted to raid several localities in the theatre of operations, but no damage or casualties are reported. Numerous air fights took place, which ended in the enemy aeroplanes being driven off, and two were shot down in the Agno Valley and near Castel Nuovo, in the Sugana Valley."

Rome, December 1st.

"Hostile aircraft made raids on several points in the theatre of operations, but were driven off by the anti-aircraft guns and fighters. Enemy aeroplanes dropped bombs on Grigno, in the Sugana valley, without doing any damage. One of our air squadrons dropped numerous bombs on the station of Volano, north of Rovereto, causing damage and fires. Another squadron dropped bombs on the station of Rifemberga (Reifenberg), in the Branizza valley. Some trains standing were hit. All our aeroplanes returned in safety."

Rome, December 2nd.

"Enemy aircraft dropped bombs on Vicenza without causing casualties, but doing some damage to the Church of St. Corona."

Rome, December 3rd.

"Our aeroplanes bombed enemy billets and Dorimberg (Dornberg) and Tabor, in the Frigido (Vippacco) Valley. All our machines returned safely."

Rome, December 4th.

"One of our air squadrons yesterday bombed the railway station for Dottogliano and Scoppo (Skopo), on the Carso [7½ miles north-east of Trieste]. Notwithstanding bad weather conditions and the violent fire of the enemy artillery, our aviators came down low to drop a ton and a half of high explosive on the targets. Numerous air fights took place, and one enemy machine was brought down; one of ours is still missing.

"Hostile seaplanes dropped bombs at several points on the Carso, without causing casualties or damage. As a reprisal an aeroplane dropped five large bombs on the floating hangars at Trieste, with excellent results."

Serbian. *Salonica, November 29th.*

"Our aviators bombarded objects of military importance at Prilep."

Bulgarian. *Sofia, November 29th.*

"An enemy aeroplane dropped two bombs on the village of Radolivo."

Sofia, December 2nd.

"Two enemy seaplanes, flying from the Island of Thasos towards Porte Lagos, were received by our artillery and machine-gun fire. At the same time two German seaplanes bore down upon them. One of the enemy seaplanes was brought down on land and the other into the sea. We made prisoners the four aviators, one of whom was wounded."

BRITISH AIR WORK.

The following typical incidents extracted from the *communiqués* of the Royal Flying Corps in France from October 14th to October 28th, have been issued by the Air Board:—

"Oct. 15th, Co-operation with Artillery.—Artillery fire was directed by our aeroplanes on to many hostile batteries. A building believed to be an ammunition depôt was hit and a heavy explosion resulted. Direct hits were also obtained on two anti-aircraft batteries. In another sector of our front our artillery fire, directed by aeroplanes, destroyed 70 yards of railway, damaged two gun pits, and blew up six ammunition pits. Second Lieutenant H. attacked and dispersed from a height of 800 feet a company of infantry.

"Oct. 16th, Fights with Hostile Aircraft.—Second Lieutenant B. and Air-Mechanic B. engaged three machines, one of which crashed to earth. Four French machines joined in the fight, which resulted in the destruction of a second German machine.

"Oct. 17th, Bombing.—Two railway stations were simultaneously attacked by our machines. In one case a moving train was hit, and in both cases damage was observed to the station buildings and rolling stock. Nineteen 12-lb. bombs were also dropped on a siding and ammunition dump.

"Oct. 20th.—This was a day of great aerial activity, and well illustrates the extent and variety of the services performed by our airmen in the field.

"Reconnaissance.—Six of our machines, while taking photographs, were heavily attacked by anti-aircraft, guns, and soon after by 12 hostile fighting machines. One of our machines was brought down by the enemy in his lines and another brought to land behind our lines, with the pilot severely wounded. The enemy machines having withdrawn, Captain D., the leader of our formation, tried to complete his reconnaissance accompanied by only two escorting machines. He was again attacked, and another of our machines retired with engine and propeller damaged. Captain D. then fought his way homeward, surrounded by hostile machines, and landed safely.

"Artillery Co-operation.—In spite of somewhat serious enemy opposition in the air, this was maintained along our whole front, and fire was directed on to 141 targets.

"Bombing.—Nineteen incendiary and 66 20-lb. bombs were dropped on hutments. A railway station and sidings were raided, the permanent way damaged and four trucks derailed. Some ammunition sheds were also attacked.

"Photography.—More than 700 photographs were taken.

"Fights with Hostile Aircraft.—The number of combats in the air exceeded 80. Seven enemy machines were seen to crash or to fall out of control, and there can be no doubt that others of these which were driven down by our airmen were wrecked in landing. The fact that these combats took place over the enemy's lines prevents absolute verification.

"Casualties.—It is not to be expected that operations on this scale can be carried out without losses of valuable lives or without wastage in material. Three of our airmen were killed, three reported missing, and five wounded.

"Oct. 21st.—Second Lieutenant T. and Second Lieutenant A., on offensive patrol, brought down two machines. One was seen to fall in a wood, and its destruction was confirmed. The second machine fell in flames.

"Second Lieutenant S., though mortally wounded by gun fire, brought his machine and observer safely back to his aerodrome. He died of his wounds next day.

"Oct. 22nd, Artillery Co-operation.—A captured letter written by a man of a German artillery regiment affords a good clue to the damage caused by our artillery. It states that during eight weeks his battery fired 34,000 rounds and used up 28 guns, of which 17 were knocked out by British artillery fire.

"Hostile Aircraft.—Captain H. and Captain S. (Observer) engaged five enemy machines and destroyed one.

"Bombing.—Thirty-five 112-lb. bombs were dropped in and round a railway station with good results. At another station a moving train was hit, and other bombs were dropped on the buildings and rolling stock.

"Two of our machines, piloted by Second Lieutenant G. and Lieutenant S., while on patrol, encountered six enemy machines. Lieutenant S., though wounded in the head at the beginning of the fight, continued to fight for a considerable time, and drove down one of the enemy machines out of control."

The following extracts from *communiqués* received from the Royal Flying Corps in France, was issued by the Air Board on December 4th :—

"Oct. 28th.—Two of our machines were attacked by six enemy machines, who were almost immediately joined by six more. At the end of five minutes' strenuous fighting two of the German machines collided. The fight continued for about 15 minutes, when all the enemy machines withdrew and ours returned undamaged. It seems probable that this is the fight in which Captain Boelcke was killed, as he was reported in the German wireless news to have been killed as the result of a collision in the air on that date.

"Nov. 9th.—A bright clear day resulted in unusual activity on the part of the enemy's aircraft. His aeroplanes actively co-operated with his artillery. On several occasions our artillery and photographic machines were molested, and our bombing expeditions, reconnaissance and patrols were constantly engaged throughout the day while over the enemy's country.

"Night Bombing.—On the night of Nov. 9th–10th, three enemy aerodromes, two railway stations, and several trains were bombed at night by our machines. Several drums of ammunition were also fired from a low altitude into some enemy trenches."

◆ ◆ ◆ ◆

The London Raider.

According to the *Pall Mall Gazette*, the pilot of the German machine which dropped bombs on London last week was Master-Pilot Carl Meyer, the crack German aviator on the Belgian coast.

Commanders of the Lost Zepps.

German papers give the names of the commanders of the two Zeppelins lost in the last raid on England as Capt. Max Diederich and Senior Lieut. Frankenberg, both of whom are described in the German press as specially capable and meritorious officers. It is stated that Diederich was a captain in the service of the North-German Lloyd, and that at the beginning of the war he succeeded in getting the steamship *Brandenburg* out of Baltimore and bringing her safely by way of the north of Scotland to Trondhjem.

An 8,000 Feet Fall.

Writing home to his parents, 2nd Lieut. E. P. Roberts, Sussex Regiment and R.F.C., tells of a miraculous escape he had recently :—

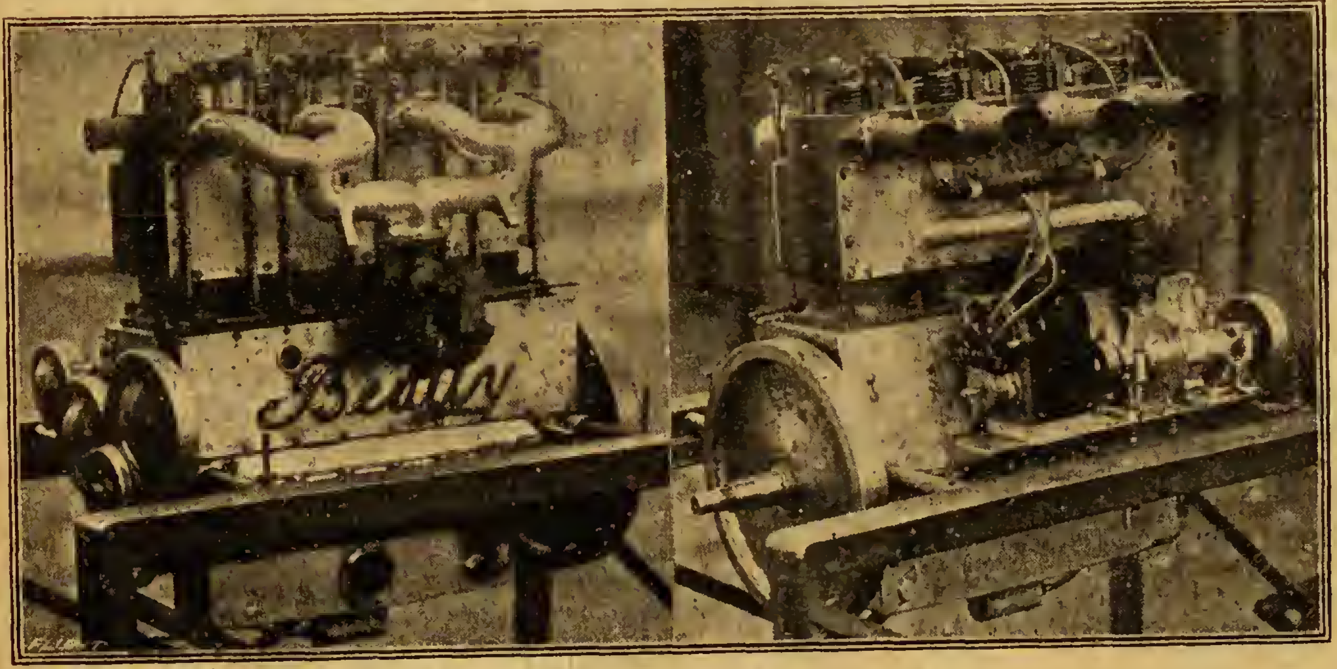
"Am out of it again for the winter. We were fighting seven Huns. My friend brought one down. I fell, out of control, for 8,000 ft. I remember falling, but don't remember hitting the ground. My machine was wrecked in a shell hole just inside our lines. At first my left leg was thought to be broken ; but now I think it is only my knee which is dislocated. Apart from being a bit tender inside I am all right. My observer is rather bad with a scalp wound, concussion, and an injured back."

A Zeppelin Victim.

At an inquest at a North-East town on December 1st, on the body of a provision dealer's manager, aged about 40, who was fatally wounded by a Zeppelin bomb on the previous Monday, a verdict was returned that he was "killed by a bomb from a Zeppelin that was the same night destroyed."

A Fatal Accident.

While starting off for a flight in the North of England, on the afternoon of November 27th, Lieut. Hall met with a fatal accident. Apparently, the engine stopped and the machine nose-dived to the ground, the pilot being instantly killed.



The Beatty engine in its latest form. The cylinders are now cast *monobloc* with aluminium side plates to the water jackets. Aluminium alloy pistons are another development. The original engine was fully described in "FLIGHT" for May 11th.

SIDE-WINDS.

WITH his wide and long experience in connection with the aviation industry, Mr. Max Worms should make a very flourishing business of his latest enterprise, the Worms Aircraft Construction Co. He has taken works at Twickenham, and while he will be open to contract for any aeroplane work, he will specialise in complete aeroplane wings. He will continue his West End offices at 4, Sackville Street, W. In this new development Mr. Max Worms has our best wishes, and we shall watch the growth of the firm with considerable interest.

* * *

IT is good news to hear that Mrs. Latimer Voigt, so well known in connection with the Integral Propeller Co., who has been very seriously ill, is now making good progress towards recovery. She has unfortunately had to undergo a serious operation for appendicitis, but it is gratifying to hear that it was completely successful, and her many friends will join in wishing her a speedy and complete restoration to health and vigour.

* * *

THE employees of Messrs. Vickers, Ltd., at their Crayford branch suffered a grievous loss on Saturday in the destruction by fire of the Princess Theatre, which, it may be recalled, was opened by Princess Christian on July 26th. During the time it has been open it has been greatly appreciated by the Vickers village, and it will be very much missed during the winter months.

* * *

ART publications of the highest character are not expected in such times as these, even with Christmas and the New Year to justify their production. Therefore the arrival this week of the 1917 "Abdulla" almanac has come as a pleasant surprise. Last year this production was quite unique amongst new issues, but the enterprise of the firm in preparing their Annual was more than justified by the result. And so again we prophesy for the 1917 edition a "sold out" ticket within a very few weeks from date. The fact that Messrs. Abdullah and Co. present 20,000 copies of their remarkable calendar for sale at 1s. each for the benefit of the British Red Cross Society, is more than justification for the work and expense put into its production. As in the past year, the firm's own advertisement on the almanac is of such an artistic design in itself, and so subdued withal, that the most particular could hardly object. In the scheme of 12 pictures —one for each month—a happy idea has been very successfully carried out. Each picture, whether in colours or tone, is by a different artist, representing England and her Colonies or one of the Allied countries, Frank Dadd, R.I., and E. A. Cox, R.B.A., being responsible for the Mother Country, Paul Thiriat for France, Michael Sevier for Russia and Alcide D. Campestrini standing for Italian art. Our thanks to Messrs. Abdulla and Co. for sending us their almanac with their compliments.

FROM THE BRITISH FLYING GROUNDS.

Bournemouth School.

ROLLING alone last week: Mr. Fisher. Straights alone: Messrs. Peat, Vermorel and Ross. Circuits and eights: Messrs. Allen, Hall and Vivian.

Instructors: Messrs. E. Bryníldsen and H. Smith.

Certificate taken during the week by Mr. Vivian. Mr. Hall did A and B tests for "ticket."

NEW COMPANIES REGISTERED.

PEGASUS AIRCRAFT CO., LTD.—Capital: £1.000, in £1 shares. Engineers, manufacturers of aeroplanes, airships and motor cars, propellers, engines, &c.

SPLINTERLESS ANTI-MIST GLASS SYND., LTD.—Capital: £1,000 in £1 shares. Manufacturers of compound, safety, uncloudable, anti-mist and multi-glass goggles and anti-gas appliances of all kinds, &c.

TIBBENHAM'S AVIATION CO., LTD., Dunster House, 12, Mark Lane, E.C.—Capital: £1,000 in £1 shares. Objects: To promote the science or sport of flying and aerial locomotion, to manufacture and deal in aeroplanes, &c. The company shall not engage in furniture or decoration work or in the manufacture of aeroplane propellers without the sanction of Frederick Tibbenham, Ltd. First directors: H. Stoner, J. G. Taylor, E. H. Cowen, F. Tibbenham and S. Cole.

UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Finsbury Park & District (66, SOUTH VIEW RD., HORNSEY).

Monthly Report.—Owing to the inclement weather experienced during the last two months, the amount of flying has been rather less than usual. A gale was blowing on Oct. 7th, but, nevertheless, two juniors, viz., R. E. Stansell and C. E. Plummer, ventured out, and made a few flights with small tractor monoplanes. Similar weather prevailed on the 14th, but Messrs. F. E. Rayner, A. Richards and E. Coleman were out with hollow-spar tractor monos., making several good flights. Mr. Rayner's model eventually smashed up. The same two juniors were out as on the previous Saturday. On the 21st all the above members were out, with the addition of Mr. H. Mullin. All the models flew well. The 28th was practically a blank day, owing to the high wind blowing. A new junior, P. J. Poultney, was at work with small mono., but unfortunately it smashed up. Had the weather been fine, Nov. 4th would have been an eventful day, as a competition had been arranged for the £1 so generously presented to the club by Mr. A. E. Jones, head of the well-known model accessory firm in New Oxford Street, London. Several machines were out, but no great durations were made. The secretary's brother (in khaki), Drummer H. M. Rayner, was flying a small Morane tractor, which developed a good speed. Wind still prevailed on the 11th, but there were seven models flying. Undoubtedly, the best flights of the afternoon were made by the hollow-spar tractor monos. belonging to Messrs. Coleman and Rayner. They were making flights of 500 yards at about 100 feet altitude, with a duration of nearly 50 secs. Other hollow-spar models were being flown by Messrs. Richards, Burchell, Hardinge, Stansell and Plummer with considerable success. The 18th was wet and windy. On the 25th Mr. Rayner was testing a large 4-foot model intended for the aforementioned competition, and found that the elevator was not large enough. Messrs. Coleman, Richards and Plummer were flying models, which behaved very well and made several lengthy flights. A club meeting was held at the house of Mr. Hardinge on Oct. 26th, when several important discussions took place. Sincere regret was felt when Mr. H. Mullin tendered his resignation from the position of treasurer; he has filled this office from the foundation of the club in the summer of 1913 Mr. A. Richards was elected to fill the vacancy, and his duties begin at the commencement of the new year. On Nov. 11th a communication was received from a junior signing himself as A. Doré, but no address was given, hence the inability of the secretary to reply.

PUBLICATION RECEIVED.

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Aeronautical Patents Published.

Applied for in 1915.

Published December 7th, 1916.

5,707. R. C. MOTTE. Bodies of aeroplanes, seaplanes, boats, &c.
15,747. O. SCHÜLE. Means for maintaining lateral balance of flying machines.
16,197. E. R. CALTHROP. Parachutes.

Applied for in 1916.

The numbers in brackets are those under which the specifications are printed and abridged, &c.

Published November 30th, 1916.

7,950. D. MACKAY. Aerostructures. (102,021.)
10,969. G. T. RICHARDS. Construction of aeroplane flying machines. (102,032.)

Published December 7th, 1916.

2,610. S. SADLER. Control handle for aeroplanes. (102,083.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week.

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6 ,, ,, ..	3	3	6 ,, ,, ..	5	6
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Should any difficulty be experienced in procuring "FLIGHT" *from local newsvendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.*

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 416. (No. 50, Vol. VIII.) DECEMBER 14, 1916. [Weekly, Price 1d. Post Free, 1½d.

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NOTICE.—Owing to Christmas Day and Boxing Day falling on Monday and Tuesday in Christmas week, it is necessary that all copy, Editorial and Advertisement, for the issue of December 28th, should reach "FLIGHT" Office not later than the morning of December 20th.

EDITORIAL COMMENT.

The Road to Victory.

WHAT a dramatic change has taken place in the aspect of things political since the beginning of the latest Cabinet crises! A fortnight ago there seemed to be no hope but that the conduct of the war would remain in the hands of the lawyer-politician combine who have stood for two long years athwart the road to victory. There seemed to be no hope of progress, no hope that the policy of "wait and see" would be departed from until, too late, the people themselves realised that everything had been given away by the leaders who did not lead and who put the sweets of office before the necessities of the Empire. To-day we have a "Business Government" in which the lawyer element, save in the case of the legal offices, is mainly conspicuous by its absence. Instead, we have Ministers selected for their posts because of the special qualifications they possess for those posts. We have a War Council of five Ministers who are to be responsible for the whole conduct of the war, while the rest of the departmental heads are left free to conduct the business of their departments and to carry out the instructions of the War Council in so far as they relate to the various departments of State. On paper at least the new constitution of the Government approaches as nearly to the ideal as may be imagined. In practice, it is so radical a departure from all accepted traditions that it really constitutes the greatest governmental experiment in all our constitutional history. While we call it an experiment—and quite rightly—we would hasten to add that it is an experiment that has been made not a moment too soon. When we regard the happenings of the past twenty-eight months, we marvel that it has been so late in the day that THE MAN has arisen to give us the new in place of the old. Blundering diplomacy and hesitating strategy, the perpetuation of inter-departmental jealousies, the farcical domestic regulations under that farcical piece of legislation the Defence of the Realm Act, the piffling attempts to deal with the food problem—all have combined to lead the thinking citizen to despair. We have had supposedly responsible Ministers of the Crown laying down in sonorous periods that this war is "a fight to a finish" and that "Britain would never sheathe the sword until Prussian militarism was destroyed"—and then going home to sleep! We have been told that the nation would be asked to make great sacrifices, and that we should have to deny ourselves many things to achieve success—while Ministers and Members of Parliament have comfortably and quietly drawn their salaries and denied themselves nothing. What wonder that the nation had become sick and tired of the whole crowd? There is no doubt that a grave volume of intense dissatisfaction had grown up as a consequence of the policy of *laissez faire* which was the principal characteristic of the late Government's conduct of affairs. Unquestionably this feeling of profound dissatisfaction was approaching a head, and we are gravely of opinion that if Mr. Lloyd George had not acted as he has there was serious danger of a sinister page of our history having to be written.

He has acted—fortunately in time. It will be by the future that he will be judged. The nation has the profoundest faith in him and is prepared to trust him to the uttermost. In return the nation will require at his hands deeds, and not the empty words of the old political clique. It is a heavy responsibility he has assumed, and it will be a heavy reckoning that the nation will exact should he fail of his own default. For the very reason that he himself has looked the situation squarely in the face and has accepted all the risks, it is for the nation to give him implicit trust. He will ask of us more and greater sacrifices than we have been called upon for in the past. They will be cheerfully made—because we trust him to lead us along the road to victory.

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What of the Air?

It is impossible for us who are so closely identified with the future in the air to regard the momentous happenings of the past few days without speculating on their possible influence on our aerial policy. When the late "crisis" came upon us we were looking forward to seeing the house put in order and an end made of the obstructionist tactics which had militated against the work of the Air Board. As we said last week, we deplored the necessity for washing dirty linen in public, though it was better washed publicly than not at all. To expose our weaknesses and show ourselves in the face of the enemy as a house divided against itself was something that on every ground was to be deprecated. But at the time there seemed no other method by which the differences that have militated against the successful expansion of the Air Services could be eliminated. The first essential was to get rid of those differences, and if that could only be accomplished as a result of open debate in Parliament—well, that was a choice of the lesser evil.

We see now in the reconstituted Government a good augury for the future. Lord Curzon, who is—or should we say was?—Chairman of the Air Board, is a member of the new War Council. We know he feels very strongly that supremacy in the air is vital to winning the war, and we may be sure that all his influence will be on the side of setting the house in order. And, as the War Council is to be supreme and the departments of State are to be subordinate to the Council for the purposes of the war, it almost goes without saying that the necessary reforms in administration will be insisted upon. We are by no means addicted to the endorsement of "wait and see," but in this case that seems to be by far the better course. It is not for the Press to indicate to the new administration the way it should go. It is enough for the moment that it has the entire confidence of the country, which believes that Mr. Lloyd George's Government is one of action all along the line. Therefore, we are content in the meantime to "wait and see." We have got in the new War Council, for the war as a whole, what we have in a restricted way advocated in regard to the control of the Air Services for a long time past—a centralisation of control of the war in all its aspects. We now await the results—let us add, with entire confidence.

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State Aid for Research.

We are getting on! Not so very long ago the very idea of State encouragement of industrial research was enough to raise a smile, but now we find it on the eve of becoming an accomplished fact. In reply to a deputation from the Board of Scientific Societies, Lord Crewe said on Friday of last week that the Government had been impressed by the need of coming further to the help of research. Consideration had been given to the question what should be done—to mention a single point—to assist the great staple industries of the country in developing systematic research on a large scale. It was clear that in the case of large and wealthy industries, where either individuals or limited companies might look to profit on a very large scale as the direct result of research, the country would not be likely to be willing to pay the whole amount devoted to research. The Advisory Council had therefore already devoted much time to conversations with leaders of different great industries in the hope of bringing about a scheme of co-operation between those leaders and themselves.

The matter of scientific research applied to industry was, it was considered, one of the cases in which an exception might be made to the usual plan of procedure by annual estimates. When co-operation of the most varied kind and on entirely different scales had to be instituted between a Government Department and a number of different industries, an attempt to estimate the actual amount required for a given year would be hopeless. Therefore the Chancellor of the Exchequer, who took a deep interest in the subject, was prepared to advise the Government to devote a very large sum, generally estimated to meet the needs for this co-operation for the period of the next five years, on a scale which ought to enable them to spend certainly four and possibly five times as much on this object of co-operation between the department and the firms as had been spent for the whole purposes of research by vote hitherto.

The Inland Revenue had told him that the Chancellor of the Exchequer had decided that no objection should be offered by their surveyors of taxes to the allowance as working expenses for income-tax purposes of contributions by traders to industrial associations which might be formed for the sole purpose of scientific research for the benefit of the various trades.

We need hardly say that we welcome so far-reaching a declaration as this, which goes far beyond what the State has ever done for industrial research in the past. In particular, too, we like the departure made in the matter of income and excess profits taxes, which should go very far to induce firms and individuals to prosecute research along the lines intended. It is altogether a notable scheme, and a hopeful one for the future.

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The "Afternoon Tea" Question.

A propos the "afternoon tea" question which was discussed in our columns recently, a valued correspondent sends us a time-table of the alleged hours kept in certain departments of the War Office. This is as follows :—

Assemble for work between 9 and 9.30 a.m.
Tea at 11 a.m.
Lunch at 12.45 p.m.
Return to work at 3 p.m.
Tea at 4 p.m.
Finish work for the day between 6 and 7 p.m.

As our correspondent pertinently asks : "What business could stand this sort of thing by the people who are supposed to be managing it ?" Our readers may perhaps think that our correspondent exaggerates, but we have the best reasons for knowing that so far from this being so, the time-table given is not by any means a bad example of the day's work of many officials holding something better than merely subordinate posts. Nor is it peculiar to the War Office. In fact, there are worse offenders in other Government offices than the War Office can produce. Possibly Lord Derby will indulge in a little combing-out of these luxuries of leisure, so that those who are paid to "get on with the war" may have time to do more "getting on." Perhaps, too, the new business heads of some other Government departments may manage to convince their officials that tea and gossip are not the beginning and end of official activity. We are not without hope.

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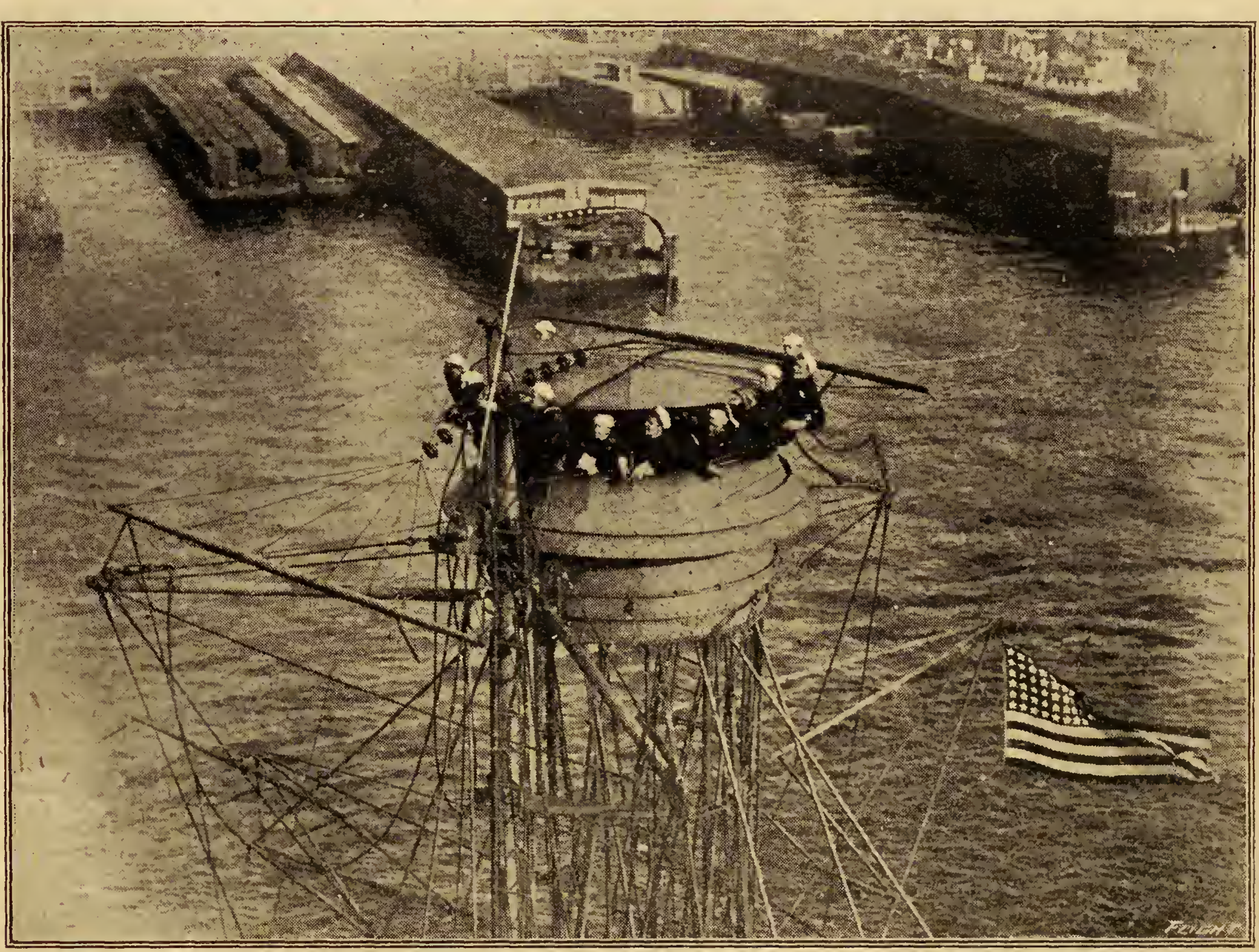
"X 54" Raid. November 27th–28th.

It was officially announced on December 12th that supplementary reports received from the police with regard to the casualties in the air raid on the night of November 27th–28th show that since November 28th, when the first return of casualties was issued, two of the injured persons have died, there has been a further death from shock, and information has been obtained of a number of cases of slight injury which were treated at home and not reported. The total casualties are as follows :—

	Men.	Women.	Children.	Total.
Killed ..	1	3	—	4
Injured ..	16	14	7	37
Total				41



HOW THE AMERICAN NAVY PROTECTS AGAINST AIRCRAFT ATTACKS FROM ABOVE.—The anti-aircraft fighting-tops of the latest U.S. super-Dreadnought, "Arizona," showing the steel overhead armouring protecting the gun crew from bombs dropped by aircraft.

The British Air Service

"PER ARDUA AD ASTRA"

Under *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* London Gazette, *it is not repeated in this column.*

Royal Naval Air Service. *Admiralty, December 5th.*

The following Flight-Lieuts. appointed as Acting Flight-Comdrs., all to date Dec. 3rd: E. J. Hodsoll, E. A. de L. de Ville, B. P. H. de Roeper, B. Travers, J. S. Mills, C. D. Morrison, A. R. Cox, R. B. Munday, R. C. Hardstaff, T. F. N. Gerrard and F. H. M. Maynard.

The under-mentioned Flight Sub-Lieuts., appointed as Acting Flight-Lieuts., all to date Dec. 3rd: L. G. Scott, M. J. M. Bryan, P. D. Robertson, G. G. McHardy, A. B. Watkins, D. R. Baylis, H. L. Everitt, D. G. Ronald, A. H. H. Gilligan, C. Murray, K. C. Buss, J. C. Mitchell, E. M. Morgan, B. S. Wemp, L. M. B. Weil, H. L'E. Tyndale-Biscoe, J. K. Waugh, H. Tether and E. L. Pralle.

The following have been entered as Prob. Flight Officers for temp. service, all to date Dec. 10th: W. T. Grieve, R. Halley, L. E. Allen and J. R. Tulley.

B. G. Ludlow granted temp. commission as Sub-Lieut., R.N.V.R., with seniority Dec. 4th.

Admiralty, December 6th.

The following Flight Sub-Lieuts. granted temp. commissions as Sub-Lieut., R.N.V.R., with seniority as mentioned: S. D. Felkin, Dec. 5th; T. H. Harkness and A. E. Mackenzie, Dec. 4th.

Admiralty, December 8th.

A. T. Gray, E. Nichols, H. Constant, R. L. Kent and L. A. Philip entered as Prob. Flight Officers for temp. service, and appointed to "President," additional, for R.N.A.S., all date Dec. 10th.

H. V. Cherry entered as Temp. Warrant Officer, 2nd grade, and appointed to "President," additional, for R.N.A.S., date Dec. 7th.

Admiralty, December 11th.

The following have been entered as Prob. Flight Officers for temp. service and appointed to "President," additional, for duty with R.N.A.S., all date Nov. 17th: W. H. Wilmot, B. B. Ball, W. E. N. Clark, R. E. Horton, C. Chrimes, A. C. Campbell-Orde, G. F. Hyams, G. W. Longley, K. Stuart, H. L. Madge, H. A. Wishaw, M. A. Harker, C. S. Mossop, P. G. Shepherd, J. A. S. Wright, G. D. Hepburn, F. N. Smith and J. M. Mason.

Royal Flying Corps (Military Wing).

London Gazette, December 5th.

Flight-Commanders.—Temp. Lieut. A. M. Thom, M.C., Gen. List, and to be Temp. Capt. whilst so employed; Nov. 1st. (Substituted for the notification in the *Gazette*, of Nov. 27th.) The initials of 2nd Lieut. (Temp. Capt.) H. F. Fisher are as now described, and not as in the *Gazette* of Nov. 25th. The surname of Lieut. (Temp. Capt.) P. A. O. Leask is as now described, and not as in the *Gazette* of Nov. 23rd.

Flying Officer.—Temp. 2nd Lieut. (on prob.) D. H. Robertson, Gen. List; Oct. 22nd. (Substituted for the notification in the *Gazette* of Nov. 8th.)

Equipment Officer, 3rd Class.—2nd Lieut. W. G. Duffield, S.R.; Oct. 28th.

Experimental Officer (graded as an Equipment Officer, 1st Class).—Temp. 2nd Lieut. H. W. Phear, R.A., from a Staff Lieut., to be transfd. to Gen. List, and to be Temp. Capt. whilst so employed; Nov. 15th.

Supplementary to Regular Corps.—2nd Lieut. J. W. G. Mackinlay to be Capt.; Nov. 18th. The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: H. E. Jarman, D. S. Kennedy, G. V. Cottam, R. W. Farquhar. The under-mentioned to be 2nd Lieuts. (on prob.): 2nd Lieut. F. G. Toy, Australian Imperial Force; Oct. 23rd. Lieut. E. D. Perney, Can. Field Art.; Nov. 11th. E. H. Acland; Nov. 14th. Nov. 17th: G. E. Seymour, A. E. McVittie, N. A. Burritt, J. L. Drummond, S. L. Crowther, J. W. Gillespie, L. N. Waddell, F. W. Rook, M. C. Healy, E. N. Hately, G. C. Atkins, H. G. Gonthier, A. L. Fleming, J. A. Raymond, A. McD. McBain, W. H. Falkner, R. W. Makepeace, R. F. Anderson, W. R. A. Campbell.

London Gazette Supplement, December 6th.

Wing Commander.—Capt. (Temp. Lieut.-Col.) G. E. Todd, Welsh R., from a Sqdn. Comdr. and Asst. Comdt., Central Flying School, and to retain his temp. rank whilst so employed; Nov. 23rd.

Flight-Commander.—Capt. C. G. Davidson, S.R., reverts to Flying Officer; Oct. 20th.

Flying Officers.—Nov. 15th: 2nd Lieut. (Temp. Capt.) D. D. Walrond-Skinner, Mon. R. (T.F.); 2nd Lieut. F. H. E. Reeve, Northd. Fus. (T.F.). 2nd Lieut. G. V. Cottam, S.R.; Nov. 16th. Nov. 18th: 2nd Lieut. (Temp. Lieut.) J. A. Williamson, R. E. Kent Yeo. (T.F.), from a Flying Officer (Ob.), with seniority from April 28th. Temp. Lieut. C. G. Gilbert, Dorset R., and to be transfd. to Gen. List; Temp. 2nd Lieut. A. H. Carman, Worc. R., and to be transfd. to Gen. List.

Supplementary to Regular Corps.—G. Barnett to be 2nd Lieut. (on prob.); Sept. 10th.

London Gazette Supplement, December 7th.

The under-mentioned to be Temp. 2nd Lieuts. (on prob.), for duty with R.F.C.:—Nov. 10th: Sergt. E. H. Trump, from R.F.C.; 1st Cl. Air-Mech. S. de Freitas, from R.F.C.; 2nd Cl. Air-Mech. A. G. S. de Ross, from R.F.C.; Pte. L. Y. Cardall, from A.S.C.; Pte. P. Sherman, from Can. A.S.C. Sergt. W. D. Matheson, from R.F.C.; Nov. 12th. Pte. F. B. Palmer, from Can. Corps Cav. Regt.; Nov. 13th.

Equipment Officer, 3rd Class.—2nd Lieut. J. Witt-Mann, S.R.; Nov. 7th.

Supplementary to Regular Corps.

Royal Flying Corps, Military Wing.—The under-mentioned 2nd Lieuts. (on prob.) are confirmed in their rank: A. L. Pattinson, C. A. M. Furlonger. The under-mentioned to be 2nd Lieuts. (on prob.): E. Brown; Sept. 17th. R. S. G. MacLean; Oct. 29th. Nov. 5th: C. W. McKissock, L. H. Meyer, L. M. Hill, E. C. Macdonnell, J. B. Crompton. Nov. 20th: W. H. Bokenham, L. G. Fenner. J. C. Murray; Dec. 4th. The Christian names of 2nd Lieut. (on prob.) Douglas Urchart McGregor are as now described, and not as in the *Gazette* of Oct. 23rd.

London Gazette, December 8th.

Flight-Commanders.—The appointment of Lieut. (Temp. Capt.) E. R. Pretyman, Som. L.I., notified in the *Gazette* of Oct. 11th, is antedated to Sept. 12th. From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. J. R. Gould, 2nd Regt., King Edward's Horse, S.R.; Sept. 17th. 2nd Lieut. W. E. Nixon, K.O. Sco. Bord.; Nov. 14th. 2nd Lieut. A. G. Knight, M.C., S.R.; Nov. 16th. From Flying Officers:—Nov. 17th: Temp. Major (Capt., Ind. Army) H. A. Hill, R. Berks. R. (T.F.); Lieut. C. L. Bath, Can. Machine Gun Serv., and to be Temp. Capt. whilst so employed. Nov. 23rd: Lieut. (Temp. Capt.) A. T. Loyd, E. Kent R. (T.F.), and to retain his temp. rank whilst so employed. From Flying Officers and to be Temp. Capts. whilst so employed: 2nd Lieut. C. E. H. C. Macpherson, R. Dub. Fus.; Temp. Lieut. C. W. Hyde, Gen. List; Nov. 25th. Temp. 2nd Lieut. O. V. Thomas, Gen. List; Nov. 27th.

Flying Officers.—Temp. 2nd Lieut. (on prob.) J. R. W. Thompson, Gen. List; Oct. 27th. Nov. 13th: Lieut. (Temp. Capt.) E. E. N. Burney, M.C., R. Berks. R., from a Flying Officer (Ob.), with seniority from June 1st; 2nd Lieut. J. A. Marshall, Hunts. Cyclist Bn. (T.F.). Nov. 14th: 2nd Lieut. (Temp. Lieut.) S. A. Villiers, R.A., from a Flying Officer (Ob.), with seniority from May 31st; 2nd Lieut. A. G. A. Davis, Devon. R., from a Flying Officer (Ob.), with seniority from May 14th. Nov. 15th: Temp. 2nd Lieut. (on prob.) C. J. Thompson, Gen. List; Temp. 2nd Lieut. C. S. Hall, Gen. List; Lieut. E. A. Thomas, Lan. R.G.A. (T.F.); Lieut. F. Billinge, Manch. R., S.R., from a Flying Officer (Ob.), with seniority from May 27th; Lieut. D. W. Davis, Can. Gen. List; 2nd Lieut. (Temp. Lieut.) P. F. J. Kent, 3rd Dn. Gds., from a Flying Officer (Ob.), with seniority from May 1st; 2nd Lieut. A. B. Dees, R. W. Surr. R. (T.F.); 2nd

Lieut. D. S. Kennedy, S.R.; 2nd Lieut. (Temp. Lieut.) J. H. B. Wedderspoon, Lowland Divl. Ammn. Col., R.F.A. (T.F.); Nov. 16th. Nov. 17th: 2nd Lieut. (on prob.) C. J. Pile, R.F.A., S.R., from a Flying Officer (Ob.), with seniority from July 28th; Temp. 2nd Lieut. (on prob.) C. D. Smart, Gen. List; Nov. 18th. 2nd Lieut. (Temp. Capt.) H. L. H. Owen, Dorset R. (T.F.), from Adjt.; Temp. 2nd Lieut. A. Binnie, R. Sco. Fus.; 2nd Lieut. A. L. Pattinson, S.R.; 2nd Lieut. R. W. Farquhar, S.R. Nov. 22nd: 2nd Lieut. R. W Buswell, Ches. Yeo. (T.F.); Temp. 2nd Lieut. (on prob.) R. Smith, E. Surr. R., and to be transfd. to Gen. List; 2nd Lieut. W. H. Markham, Manch. R., and to be secd. Nov. 23rd: 2nd Lieut. (Temp. Lieut.) F. W. W. Wilson, L'pool R. (T.F.); Temp. 2nd Lieut. (on prob.) P. Francis, Gen. List; Temp. 2nd Lieut. R. J. Rankin, Gen. List.

Memoranda.—E. C. Richardson to be Temp. 2nd Lieut. for duty with R.F.C.; Oct. 11th. Flight-Sergt. A. W. Armstrong, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Nov. 15th.

Supplementary to Regular Corps.—The under-mentioned 2nd Lieuts. to be Lieuts.:—Nov. 1st: G. Barrett, N. H. Read, E. A. B. Rice, J. L. Finney, (Temp. Capt.) H. Tomlinson, M.C.. S. J. Sibley, F. G. M. Williams, H. M. Fulton, N. Turner, W. A. Harvey, R. A. Courtney, W. O. Russell, A. W, Kilgour, (Temp. Capt.) E. G. Landon, V. P. Cronyn B. Mott. (Temp. Capt.) F. H. Songhurst, W. T. W. Wartnaby, A. N. Buchanan. 2nd Lieut. (on prob.) J. F. C. Bell resigns his commission; Dec. 9th.

London Gazette Supplement, December 9th.

Flight-Commanders.—And to be Temp. Capts. whilst so employed: Temp. Lieut. C. B. Cooke, Gen. List, from a Flying Officer; Sept. 27th. Temp. Lieut. S. A. Meller, Gen. List, from a Balloon Officer; Oct. 24th. From Flying Officers, and to be Temp. Capts. whilst so employed: Lieut. W. D. M. Bell, M.C., S.R.; Oct. 25th. Temp. Lieut. W. J. Y. Guilfoyle, Gen. List; Oct. 27th. Nov. 22nd: 2nd Lieut. (Temp. Lieut.) G. W. Hodgkinson, County of London Yeo. (T.F.); Temp. Lieut. E. C. Emmett, Gen. List; Temp. Lieut. J. Clisdal, Gen. List; Temp. Lieut. W. W. Carey-Thomas, Gen. List.

Flying Officers.—Temp. 2nd Lieut. J. F. Alcock, Gen. List, from a Flying Officer (Ob.); Oct. 29th, with seniority from Aug. 25th. 2nd Lieut. F. J. Tanner, Welsh Horse Yeo. (T.F.); Oct. 30th. Nov. 15th: Major S. A. Hargraft, 90th Canadian Inf. Bn.; Lieut. (Temp. Capt.) H. Steward, 6th King Edward's Own Cav., Ind. Army; Temp. 2nd Lieut. (Temp. Lieut.) H. L. Lascelles, Gen. List, from a Flying Officer (Ob.), with seniority from April 1st; 2nd Lieut. (on prob.) R. T. C. Hoidge, R.G.A., S.R.; Temp. 2nd Lieut. A. Pascoe, Gen. List; 2nd Lieut. W. H. Ruxton, R. Ir. Regt., S.R., and to be secd.; Nov. 17th. Temp. 2nd Lieut. A. J. Salton, Gen. List; Nov. 20th. 2nd Lieut. C. A. M. Furlonger, S.R.; Nov. 21st. Nov. 22nd: 2nd Lieut. J. B. Fenton, Middx. R. (T.F.); Temp. 2nd Lieut. F. W. Deane, R. Ir. Rif.; 2nd Lieut. (on prob.) B. Gaskin, S.R.; Temp. 2nd Lieut. C. R. Lamrock, Gen. List; Temp. 2nd Lieut. G. H. S. Cregeen, Gen. List; 2nd Lieut. (on prob.) H. T. Lydford, S.R. Nov. 23rd: Temp. 2nd Lieut. E. J. Pascoe, Gen. List; Temp. 2nd Lieut. H. T. O. Windsor, R. Muns. Fus., and to be transfd. to Gen. List; 2nd Lieut. (on prob.) A. C. Reeves, S.R.; 2nd Lieut. T. O. Clogstoun, R. War. W., and to be secd.

Equipment Officers, 1st Class.—And to be Temp. Capts. whilst so employed:—Nov. 17th: Lieut. R. P. J. M'Coy, S.R., from the 3rd Cl. 2nd Lieut. (Temp. Lieut.) N. Turner, S.R., from the 2nd Cl.

Equipment Officers, 2nd Class.—From the 3rd Cl.:—Nov. 17th: Lieut. (Temp. Capt.) J. B. Bowen, Pembroke Yeo. (T.F.); Lieut. G. G. Lever, R. Fus., S.R. From the 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Nov. 17th: 2nd Lieut. W. Boag, S.R.; Temp. 2nd Lieut. A. L. Wilson, Gen. List; Temp. 2nd Lieut. E. E. Castle, Gen. List. Lieut. S. Ransom, S.R., from the 3rd Cl.; Nov. 19th.

London Gazette Supplement, December 11th.

Flight-Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. (Temp. Lieut.) A. L. Macdonald, M.C., R. Highrs.; Sept. 14th. Temp. Lieut. H. V. Stammers, Gen. List; Sept. 19th.

Flying Officers.—Capt. R. Bell-Irving, 29th Can. Inf. Bn.; July 20th. (Substituted for the notification in the *Gazette* of Aug. 17th.) Nov. 21st: Temp. Lieut. F. D. Stevens, Gen. List, from a Flying Officer (Ob.), with seniority from June 21st. 2nd Lieut. (Temp. Lieut.) T. S. Roadley, S. Staff. R., S.R., from a Flying Officer (Ob.), with seniority from June 21st. 2nd Lieut. C. P. Thornton, L'pool. R., S.R., and to be secd.; 2nd Lieut. (on prob.) A. L. Constable, S.R. Temp. 2nd Lieut. C. C. Sharp, Hamps. R., and to be transfd. to Gen. List; Nov. 23rd.

Equipment Officers, 3rd Class.—Capt. J. H. Jackson, ret. List; Oct. 31st. 2nd Lieut. A. Burgess, S.R.; Nov. 24th.

Memoranda.—The under-mentioned to be Temp. Lieuts. whilst serving with R.F.C.:—Aug. 1st: 2nd Lieut. R. Collis, E. Surr. R.; Temp. 2nd Lieut. E. L. Hyde, Temp. 2nd Lieut. R. C. Bryant, Temp. 2nd Lieut. F. D. Jackson, Temp. 2nd Lieut. E. L. Roberts. 2nd Lieut. (on prob.) E. Christmas, from R.F.C., S.R., to be Temp. 2nd Lieut. on Gen. List for duty with R.F.C.; Nov. 24th.

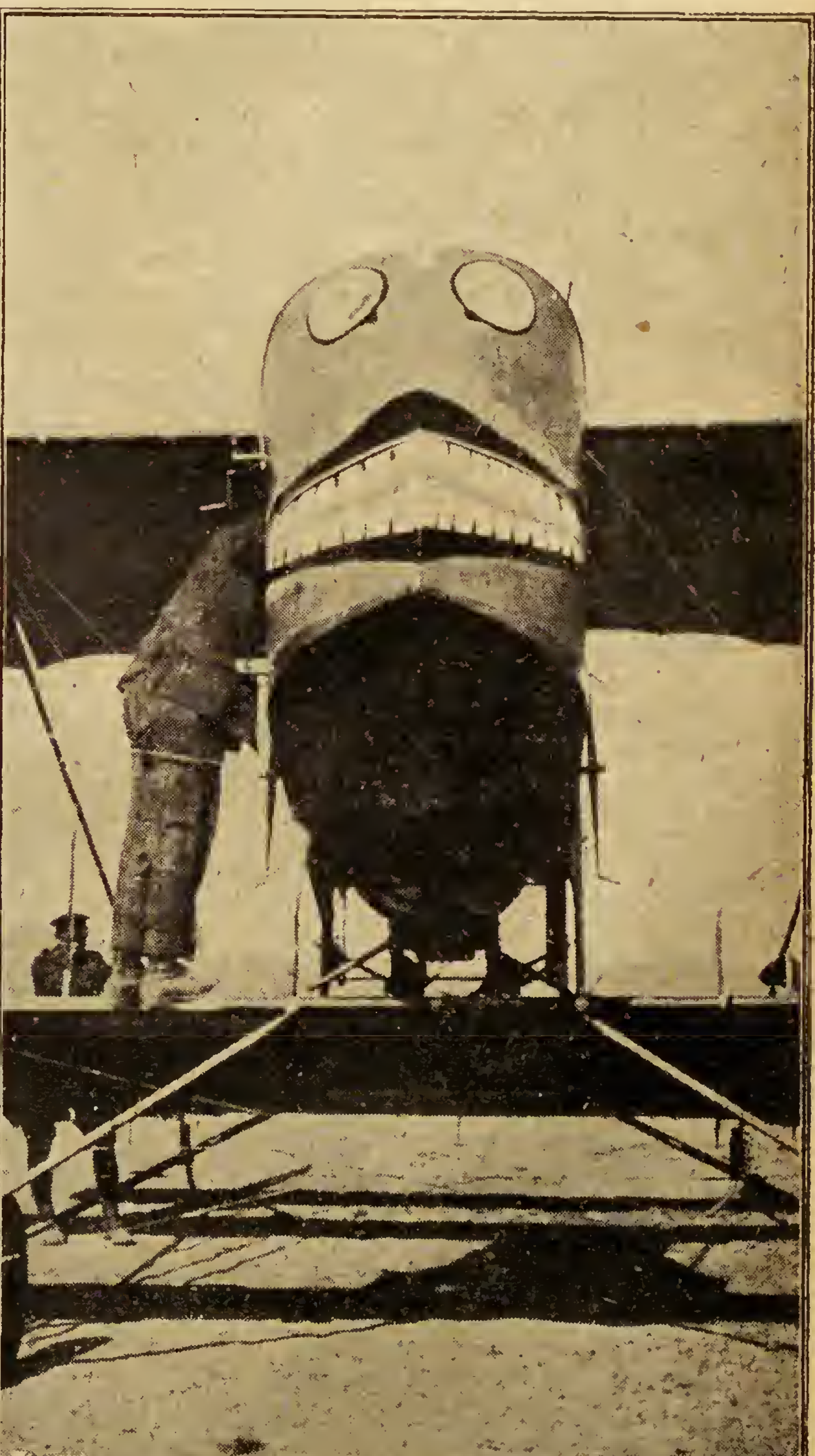
Royal Flying Corps (Territorial Force).

London Gazette Supplement, December 6th.

Hampshire Aircraft Parks.—The announcement of the seconding of 2nd Lieut. (Temp. Capt.) W. S. Farren, which appeared in the *Gazette* of Nov. 7th is cancelled.

London Gazette Supplement, December 9th.

Hampshire Aircraft Parks.—2nd Lieut. (Temp. Lieut.) F. A. Short to be Temp. Capt.; Nov. 1st. The under-men-



In the Mediterranean with the British Naval Forces. —A grotesque design decorating one of the aeroplanes of the R.N.A.S.

tioned 2nd Lieuts. to be Temp. Lieuts. :—Nov. 1st : H. Medcalf, R. Harrison, G. S. Wilkinson.

Aeronautical Inspection Department.

London Gazette, December 8th.

Lieut. G. B. Bulman, R.F.C., S.R., to be Temp. Capt. (without the pay and allowances of that rank) whilst employed as an Inspector, A.I.D. ; Oct. 1st.

London Gazette Supplement, December 11th.

The under-mentioned Temp. Hon. Lieuts. to be Temp. Hon. Capts. whilst employed as Inspectors, A.I.D. ; Nov. 1st. A. A. Ross, H. P. Philpot, G. S. Walpole. The under-mentioned to be Temp. Hon. Lieuts. whilst employed as Asst. Inspectors, A.I.D. :—Nov. 1st : A. R. Howard, F. D. Scott, W. S. Smith, A. Chapman, R. J. Grant, P. R. Callard, P. C. Thornton, A. J. Simpson.

Schools of Military Aeronautics.

London Gazette Supplement, December 11th.

Chief Instructors (graded as Squadron Commanders).—From Flight-Comdrs. and to be Temp. Majors whilst so employed: Lieut. (Temp. Capt.) L. W. F. Turner, S.R. ; Oct. 1st. Capt. A. H. Jackson, Notts. and Derby. R. ; Oct. 25th.

Instructors.—Graded as a Flight Comdr. : 2nd Lieut. (on prob.) (Temp. Lieut.) G. J. Read, N. Staff. R., S.R., from a Flying Officer, and to be Temp. Capt. whilst so employed ; Sept. 19th. Graded as an Equipment Officer, 2nd Cl. : Capt. V. O. Rees, Lond. R. (T.F.), from an Equipment Officer, 3rd Cl. ; Oct. 1st.

Examining Officer (graded as an Equipment Officer, 2nd Class).—Temp. Capt. T. E. Gilmore, Gen. List, from an Equipment Officer, 3rd Cl. ; Sept. 19th.

HONOURS.

Egyptian Honour for R.N.A.S. Officer.

It was announced, on December 5th, that the King had granted authority for the wearing of the following decoration :

Fourth Class of the Order of the Nile (conferred by the Sultan of Egypt) :—

Squadron Commander C. J. L'E. Malone, R.N.

More Rewards for the R.F.C.

In a special supplement to the *London Gazette*, issued on December 11th, the following appeared :—

His Majesty the King has been graciously pleased to approve of the appointments of the under-mentioned officers to be Companions of the Distinguished Service Order in recognition of their gallantry and devotion to duty in the field :—

2nd Lt. A. G. Knight, M.C., R.F.C.

For conspicuous gallantry in action. He led four machines against eighteen hostile machines. Choosing a good moment for attack, he drove down five of them and dispersed the remainder. He has shown the utmost dash and judgment as a leader of offensive patrols.

His Majesty the King has been graciously pleased to confer the Military Cross on the under-mentioned officers and warrant officers in recognition of their gallantry and devotion to duty in the field :—

2nd Lt. (Temp. Lt.) D. D. G. Hall, York. R. and R.F.C.

For conspicuous gallantry in action. He has flown in the worst of weather and often at very low altitudes. On one occasion he flew very low under a heavy fire from the ground, in order to range our artillery.

2nd Lt. (Temp. Capt.) H. Jameson, R.F.C.

For conspicuous gallantry in action. He attacked a hostile kite balloon under very heavy fire. Later his machine descended to within 150 ft. of the ground, when he got the engine going again, and recrossed our lines at 1,300 ft. and returned safely. He has on many occasions done fine work.

Temp. Lt. R. Johnstone, Gen. List and R.F.C.

For conspicuous gallantry in action. He has shown marked courage and initiative in turning our artillery on to columns of enemy infantry. On one occasion he carried out counter battery work in cloud and mist at 800 ft. under heavy fire from the ground.

Lt. R. J. Lowcock, Notts and Derby R. and R.F.C.

For conspicuous gallantry in action. He beat off an attack by four enemy machines and continued his ranging. Later, he flew under 1,000 ft. in a zone full of shells, in order to silence hostile batteries.

Capt. C. Mackay, Leins. R., Spec. Res., and R.F.C.

For conspicuous gallantry in action. In very unfavourable weather he obtained most valuable photographs of the enemy's position. He fought four hostile machines for ten minutes, until assistance arrived and they were driven off ; afterwards he continued his work with the artillery.

Temp. 2nd Lt. H. A. Pearson, R.F.A. and R.F.C.

For conspicuous gallantry in action. He flew with another officer under 1,000 ft. in our shell zone in order to silence hostile batteries. He has rendered the most valuable services throughout as an artillery observer.

The under-mentioned has been awarded a bar to his Military Cross for subsequent acts of conspicuous gallantry :—

2nd Lt. (Temp. Capt.) J. O. Andrews, M.C., R. Scots and R.F.C.

For conspicuous gallantry in action. He showed great courage and determination in leading successful patrols and attacks on hostile aircraft, and has now accounted for his ninth machine. On one occasion he followed a machine down to 800 ft., on another he went down to 500 ft. (The Military Cross was awarded in *London Gazette*, dated October 20th, 1916.)

His Majesty the King has been graciously pleased to approve of the award of the Distinguished Conduct Medal to the under-mentioned non-commissioned officer for acts of gallantry and devotion to duty in the field :—

3464 Sergt. B. Ankers, R.F.C.

French Honours for the R.F.C.

In a special supplement to the *London Gazette*, issued on December 10th, it was announced that the President of the French Republic has bestowed the decoration "Croix de Guerre" on the under-mentioned officers and non-commissioned officers, in recognition of their distinguished service during the campaign :—

Major Sidney Smith, R.F.A. and R.F.C.

Capt. (Temp. Major) Thomas W. C. Carthew, D.S.O., Bedford Regt. and R.F.C.

Lieut. (Temp. Capt.) V. S. Brown, R.F.C. Spec. Res.

Second Lieut. (Temp. Lieut.) Malcolm Henderson, D.S.O., Seaforth Highrs. and R.F.C.

3192 Corp. Arthur Winterbottom, late R.F.C.

More Military Medals for the R.F.C.

It was also announced, on December 10th, that His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field to the under-mentioned non-commissioned officers and men :—

839 Sergt. W. Beard, R.F.C.
17518 Actg.-Corpl. F. Froom, R.F.C.
10720 Second Air-Mech. B. Harrison, R.F.C.
19723 Second Air-Mech. D. P. Hepburn, R.F.C.
892 Flight Sergt. J. B. McCudden, R.F.C.
19101 First Air-Mech. L. C. Roberts, R.F.C.
S.R. 7. Corpl. C. Wills, R.F.C.

Air Work at Salonica.

In the despatch from Lieut.-General G. F. Milne, C.B., D.S.O., commanding British Salonica Army, dated October 8th, describing the operations in the summer and early autumn, it is mentioned that several bombing raids were carried out by the R.F.C. Later, General Milne says : "The Royal Flying Corps, in spite of the difficulties which they had to overcome and the great strain on their resources, rendered valuable assistance."

Among the names of those officers and non-commissioned officers whose services General Milne considers deserving of special mention, are the following :—

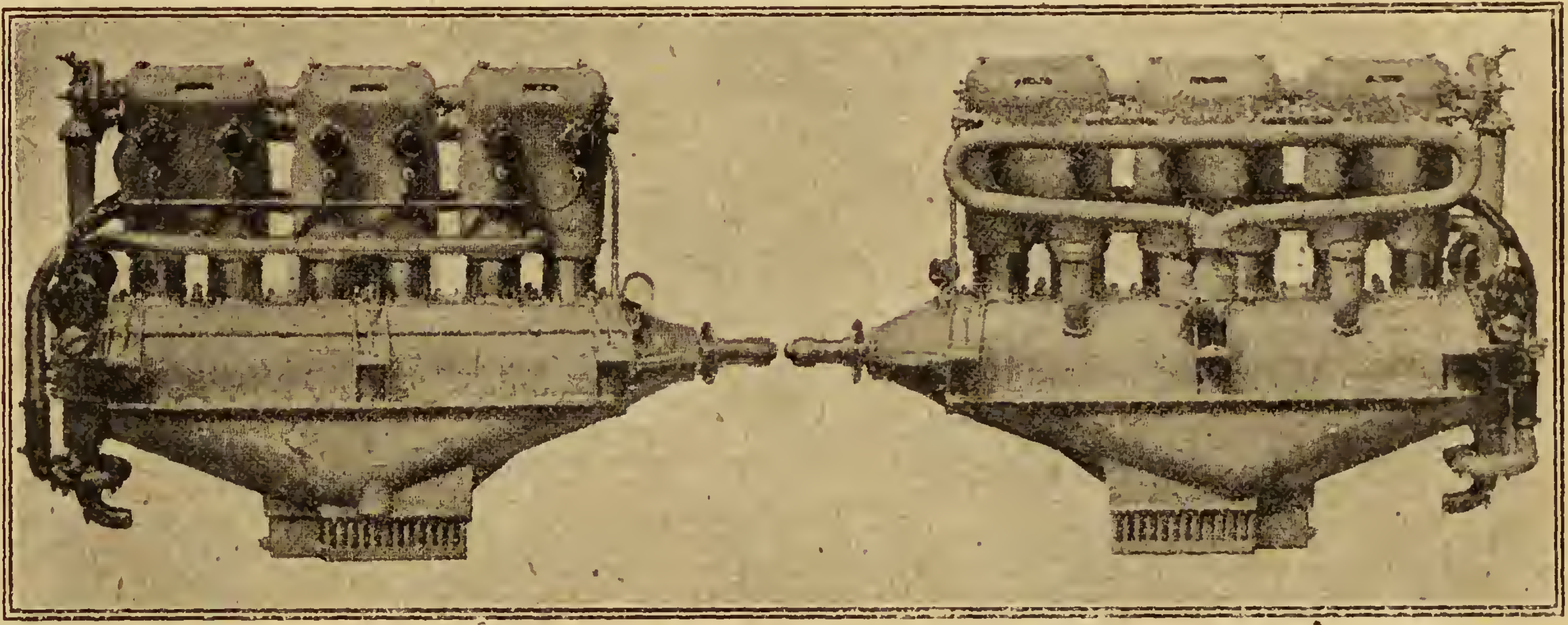
R.N.A.S. : Capt. (Temp. Major) C. F. Kilner, D.S.O.; R.M.

R.F.C. : Major (Temp. Lieut.-Col.) G. W. P. Dawes, R. Berks R. ; Capt. F. Hudson ; Lieut. O. I. Preston, Notts and Derby R. ; Temp. 2nd Lieut. (Temp. Lieut.) G. W. M. Green ; 2nd Lieut. (Temp. Lieut.) H. G. Thornton, North'n R. ; No. 198 Sergt.-Major F. Whilton ; No 2169 Sergt. F. Dorsey.

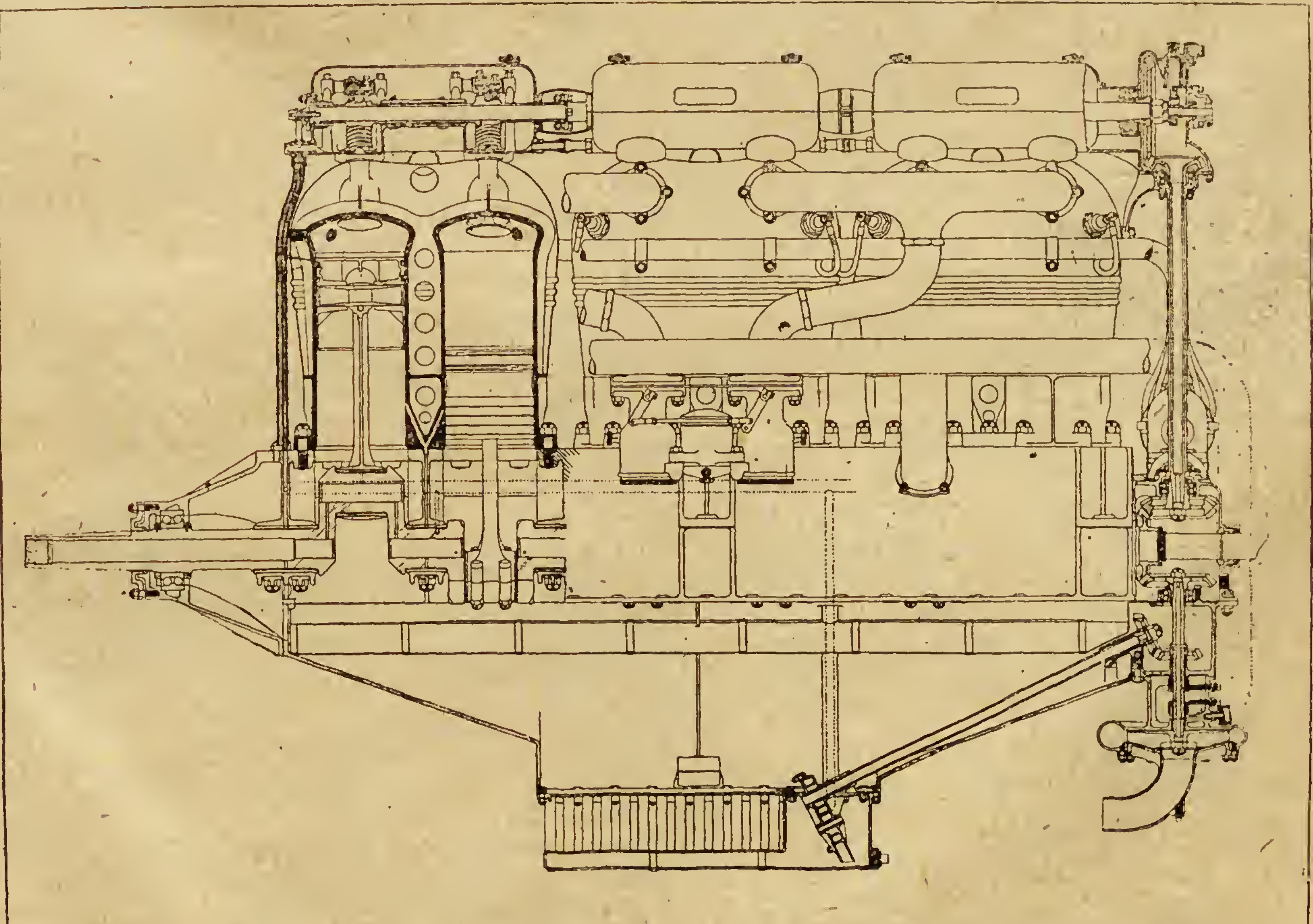
SOME AMERICAN AERO ENGINES.

THE 120 H.P. CHRISTOFFERSON.

After having undergone extensive preliminary tests, a new 120 h.p. 6-cylinder vertical water-cooled aero engine was recently put on the market by the Christofferson Aircraft Co., of Oakland, Cal., U.S.A., and among the most interesting features are the overhead camshaft and the lubrication system. The cylinders, with a bore and stroke of 4¾ ins. and 6 ins. respectively, are of steel, containing 75 per cent. carbon and 3½ per cent. nickel, having a tensile strength of 73·6 tons per sq. in. Each pair of cylinders has one water jacket of ample proportions, the jackets being of aluminium. The valves are of tungsten steel, 2⅜ ins. diameter, and are located in the cylinder head, one on each side. They are actuated by a single overhead camshaft driven from the crankshaft by a vertical shaft and bevel gear. The camshaft is divided into three sections, one for each pair of cylinders, and is so connected that one or other of the pairs of cylinders can be removed complete without interfering with the other sections.

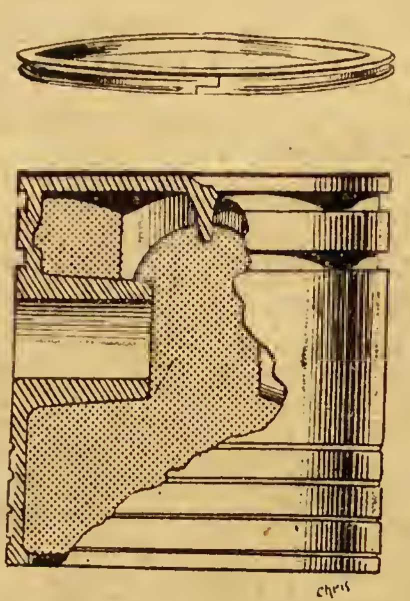


Two side views of the latest 120 h.p. Christofferson aero engine.



Elevation and part sectional drawing of the 120 h.p. Christofferson aero engine (original design).

The whole of the camshaft and valve gear is totally enclosed by an extension of the water jacket, and is constantly sprayed with oil. At the driven end of the camshaft is a small air pump, operated by a ball-bearing eccentric, which supplies air pressure for the petrol feed.

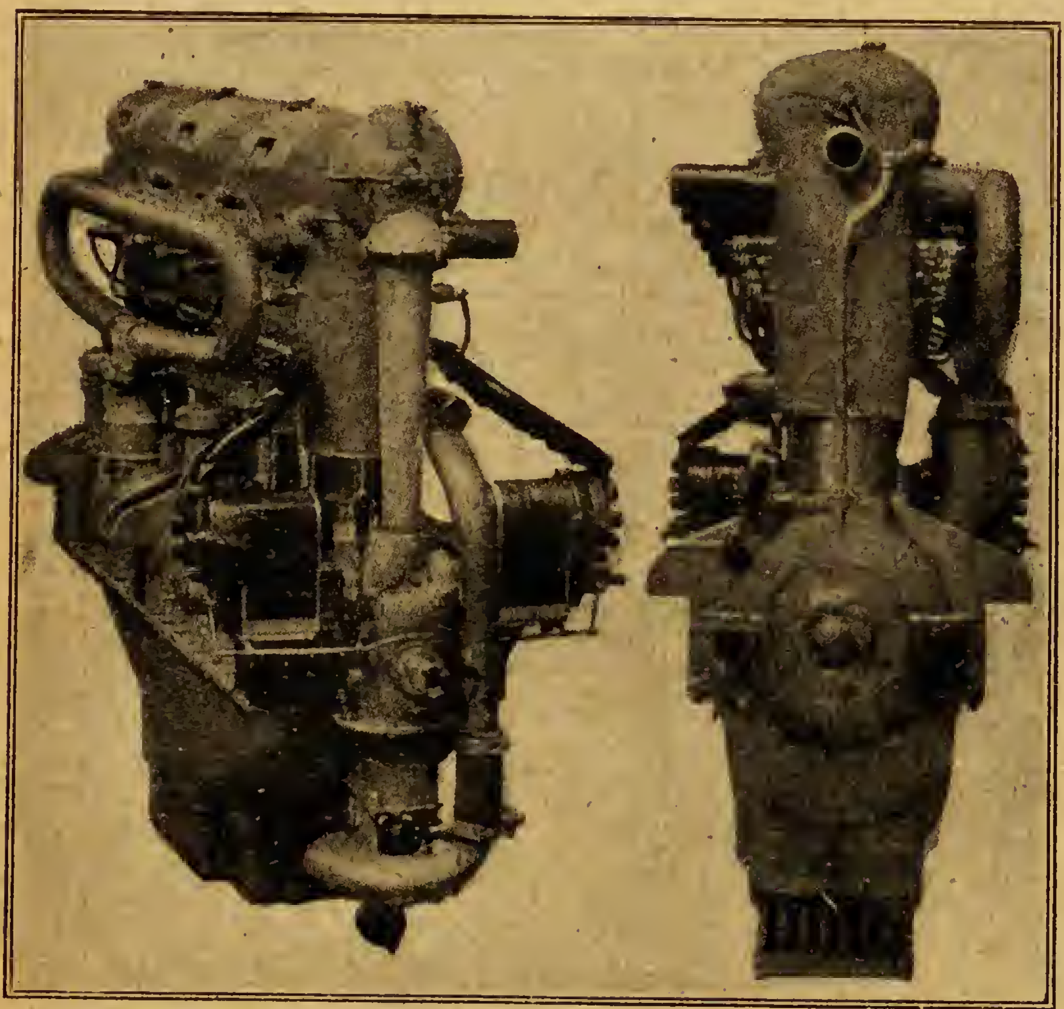

Sketch of the piston and ring of the 120 h.p. Christofferson aero engine.

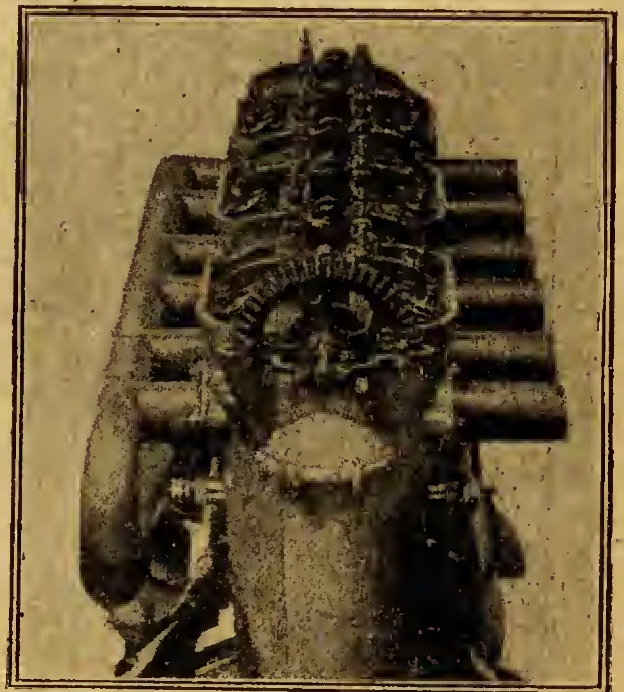
The pistons are of "Aloyanum," an aluminium alloy having an ultimate strength of about 18 tons per sq. in., and each weigh 1¾ lbs. They are fitted with two Burd high compression rings, and grooves are formed on the lower portion of the walls. The connecting rods are I section made from chrome vanadium steel, the tensile strength of which, when heat treated, is 100 tons per sq. in. Seven main bearings support the crankshaft, whilst the thrust, in either direction, is taken by a double row Heso-Bright ball-bearing mounted next to the propeller. This latter bearing may easily be adjusted by removing the lower portion of the crankcase end. Each main bearing is 2⅛ ins. diameter. Quite an important feature consists of the propeller flange, which can be detached from the motor with the greatest of ease. The crankcase is of Aloyanum, and is horizontally divided so that when removed the crankshaft is easy of access. The cooling water is circulated by a centrifugal pump driven off the end of the crankshaft.

Ignition is by two Bosch magnetos driven off the lower bevel of the vertical shaft that drives the camshaft. There are two plugs to each cylinder, and these are located immediately under the valves.

Lubrication is forced throughout, the oil being drawn from the sump and forced by a gear pump, driven off the water pump shaft, through passages formed in the crankcase to all the crankshaft bearings and through the hollow crankshaft to the big ends, thence up the connecting rods to the gudgeon pins. Ducts also lead oil from the main passage to the cylinder walls, whilst oil is delivered to the cams and camshaft by way of a pipe at the end of the engine. Oil from the camshaft case drains back to the crankcase through a larger pipe, within which is the feed pipe just referred to, and also down the tube containing the vertical shaft driving the camshaft. All the gears are thus well lubricated. Before passing from the crankcase to the sump the oil flows through a cooling radiator, which will be seen at the bottom of the crankcase in the accompanying illustrations. A by-pass at the side of the crankcase enables the oil pressure to be regulated from 10 to 100 lbs. A double Miller or Zenith carburettor is fitted, the mixture being conveyed to the cylinders by the curious loop-form induction pipe shown in the side view. The weight of this engine complete, but not including exhaust pipe and propeller flange, is 511½ lbs., giving a weight per h.p. at 1,400 r.p.m. of 4·26 lbs.

Tested last May by the technical committee of the Automobile Club of America, one of these engines gave the following results:—The test for h.p., fuel consumption, &c., showed that 96·5 h.p. was developed at 1,199 r.p.m., 113 h.p. at 1,390 r.p.m., and 130·9 h.p. at 1,655 r.p.m., the fuel consumption at these speeds being ·68, ·68, and ·64 lb. per h.p. hour. The average speed during the 5 hrs. 15 mins. running was 1,449 r.p.m., the average h.p. 113·6, and the average petrol consumption was 9·4 gals. per hour.


Three-quarter and end views of the latest 120 h.p. Christofferson aero engine.


The overhead camshaft and valves of the latest 120 h.p. Christofferson aero engine.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Members.

In accordance with the rules, the Annual Subscription of any New Member who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

New Club Premises.

The arrangements for the alterations, decorations, furnishing, &c., of the New Club House are in the hands of a special Committee, and the work is progressing very satisfactorily. There will be a billiard room, smoking lounges, buffet, reading and writing room, dining room and bedrooms. The house is situated within three minutes' walk of the present Club premises.

Annual Subscription.

In accordance with the resolution that was passed unanimously at the Special General Meeting of the Members held on the 27th July, 1916, "the subscription to the Club for the year 1917 and thereafter will be £5 5s."

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

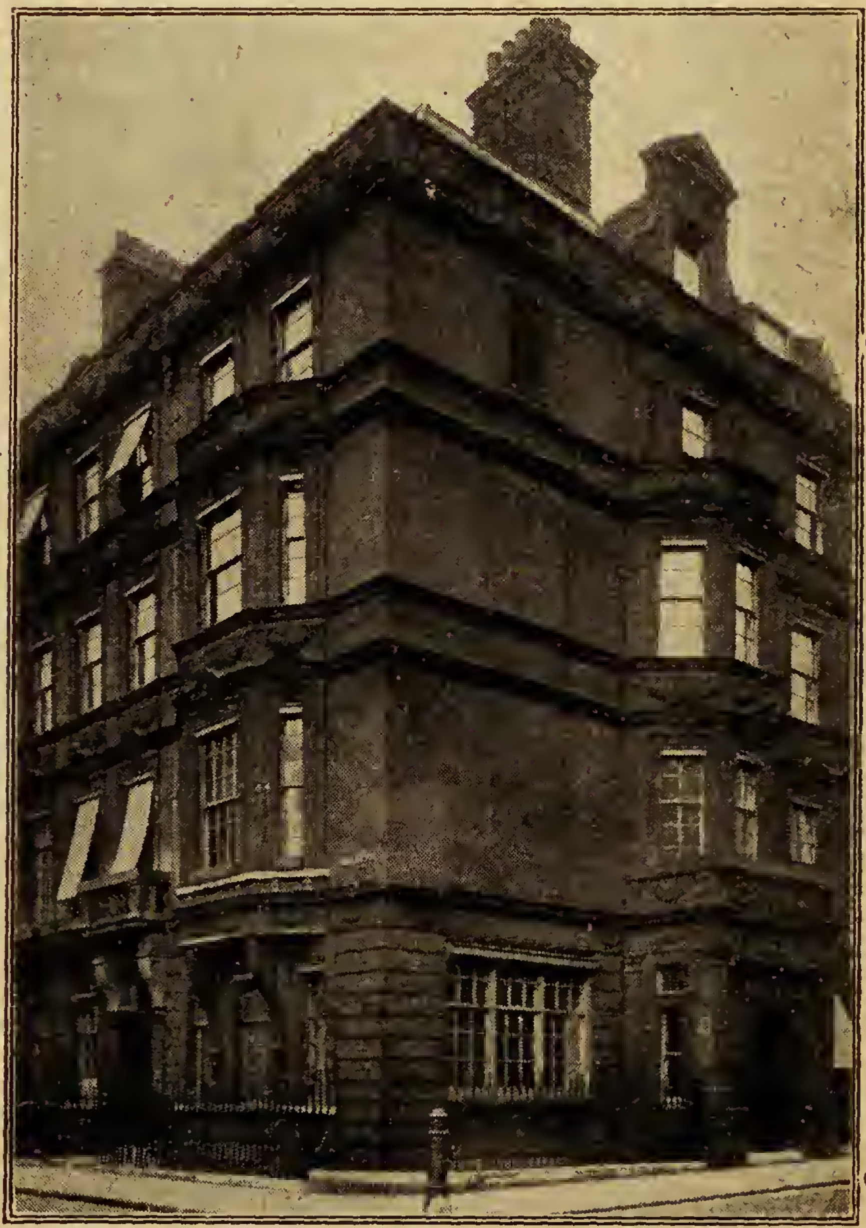
The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Dec. 5th, 1916 ..	11,075	8	10
Officers at Royal Naval Air Station, Redcar ..	10	0	0
Collected at the Westland Aircraft Works, Yeovil (Sixtieth contribution)	0	13	4
Staff and Workers of Gwynnes, Ltd. (Twenty-eighth contribution)	9	0	10
Employés of Ruston, Proctor and Co., Aircraft Works (Fourteenth contribution)	3	0	0
Total, December 12th, 1916 ..	11,098	3	0

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.



The Car.

No. 3, Clifford Street, New Bond Street, W. The new premises of the Royal Aero Club.

AVIATION IN PARLIAMENT.

Enemy Air-Raids and Reprisals.

Mr. Joynson-Hicks, in the House of Commons, on December 4th, asked the Prime Minister whether, as an enemy aeroplane has now deliberately dropped bombs on the undefended parts of London, he will consider the desirability of giving definite notice to the enemy that on any recurrence we shall hold ourselves at liberty to bomb their towns by way of reprisal?

The Prime Minister: I do not think it desirable to give warning to the enemy of our intentions in this matter.

Aircraft Raid Insurance.

Mr. Boyton asked the Secretary to the Treasury whether, under the Government scheme of insurance against damage by aircraft, he has taken, or will take, the necessary measures to ensure that money paid under such insurance policies in satisfaction of damage done shall be expended on the insured premises in all cases where there are two or more interests, or that no person or the Government shall have power to recover their loss from any third person who may be under the usual lessee's covenants for repairs?

Mr. Runciman: My right hon. friend has asked me to answer this question. Special legislation of a difficult and contentious character would be required to give effect to the proposals made in the question, and as at present advised I cannot recommend legislation on these matters.

As far as the Government Aircraft Insurance Scheme is concerned, when a loss is paid the Government is subrogated to the rights of the insured against any other person primarily liable. Whether the Government would exercise those rights would depend upon the circumstances and equities of each case. Hitherto the Government have refrained from exercising those rights if the other person is uninsured.

A ROTARY SHAPING MACHINE FOR AIRCRAFT PROPELLERS, &c.

IT was in watching the operations with ordinary joiner's chisel and gouge, draw-knife and spoke-shave, that the inventor of the Rotary Shaping Machine was struck with the tediousness of the whole process, and was seized with the idea of introducing power for both the removal of the waste in bulk and the final shaping of propellers for aircraft.

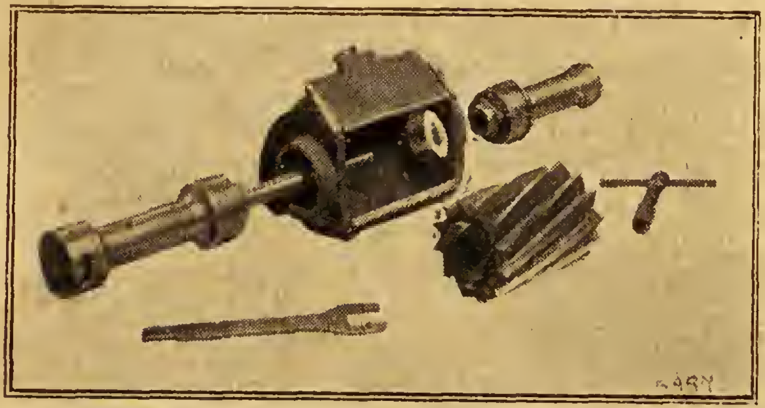


Fig. 1.—The parts of the apparatus dissembled.

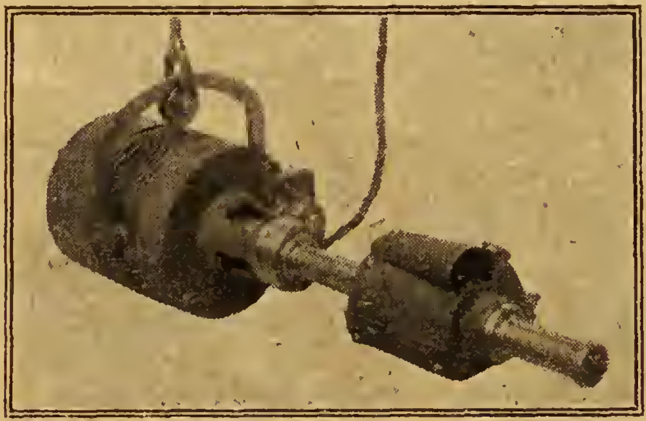


Fig. 2.—Motor drive. The funnel seen on top of the tool casing is for the ejectment of chippings.

Owing to the difficulty of working an aircraft propeller by machine, the shaping has hitherto been largely done by hand, and in order to have any chance of success the inventor saw that the machine would be required to impart the sensitiveness of the pressure of the human hand. This led him to think of a mobile rotary cutter, somewhat similar in principle to the hairdresser's rotary brush.

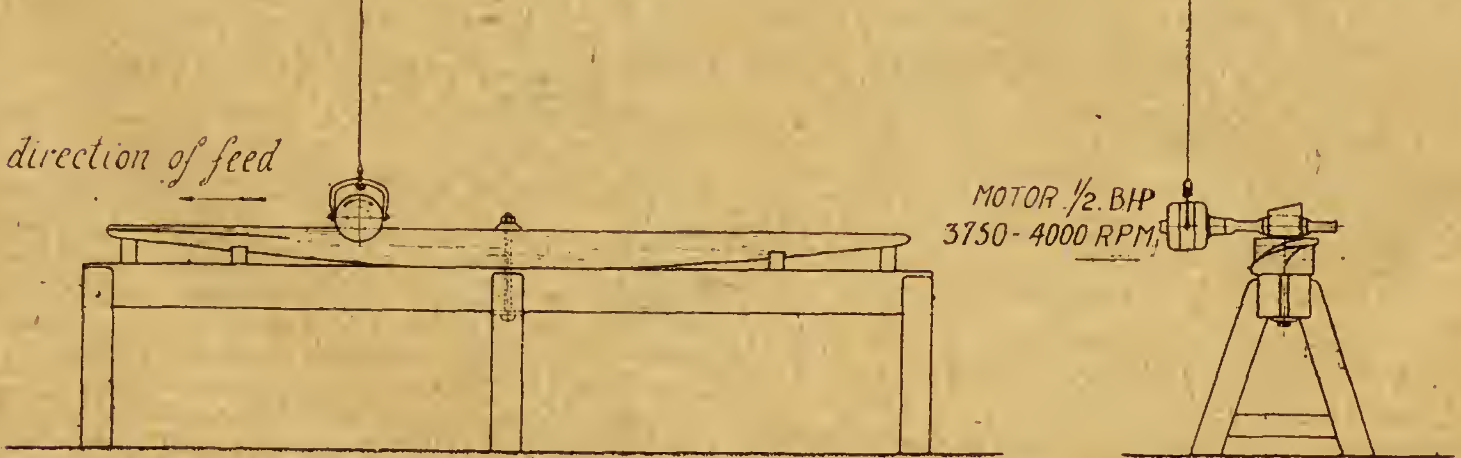


Fig. 4.—Showing direct motor drive arrangement.

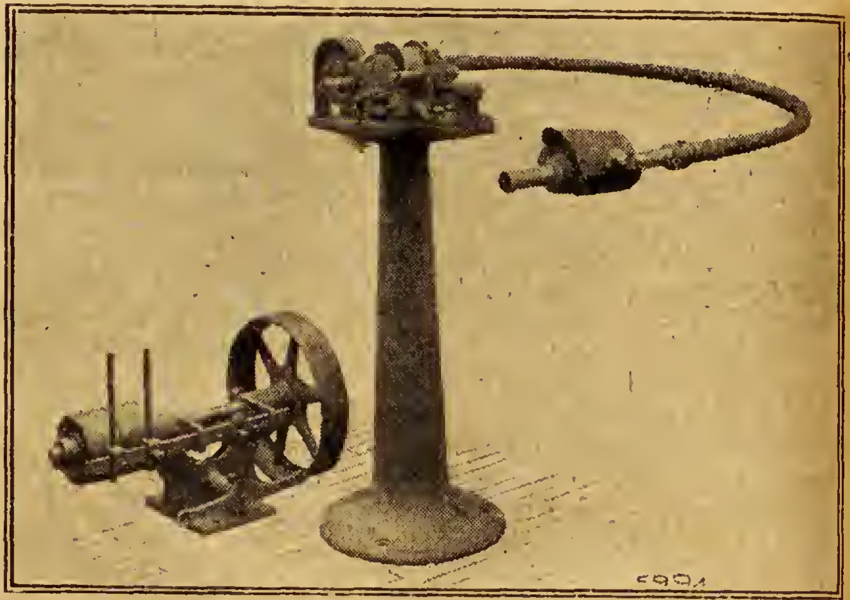


Fig. 3.—The Flexible shaft drive. Emery wheel for sharpening cutter mounted on standard.

By reference to Fig. 1, it will be seen that the apparatus consists of a rotary cutter which revolves in a casing, handles being provided for holding and directing the tool, and the power being connected (through the handle at one end) in the shape of an electric motor, or through a flexible shaft to a pulley driven from the lineshaft. The tool used is of the milling cutter type, about 3 ins. in diameter by 4 ins. in length having about 12 teeth, which operate with a shear cut, the shear being arranged to drive the chippings obliquely in the direction of an outlet in the casing provided for the purpose. The casing is made of gun-metal and steel, as light as practicable. The opening seen in the casing is for the projection of the cutters, and it can be varied by means of the adjustable shutter or slide seen immediately above, this adjustment being required for regulating the depth of cut. The shutter is secured to the casing in side guides or slots. The outlet for the ejectment of the chippings is best seen in Fig. 2. It is funnel shaped, and arranged so that the chippings are delivered to the right-hand side of the operator, and away from the driving shaft or motor. The cutter spindle is carried in self-aligning double-row radial-type ball bearings, the inner and outer races of which are secured in position by lock nuts. The cutter is easily removed from the machine by slackening two clamping screws, withdrawing the handles and spindle, and raising the adjustable slide. The ease with which this is done will be clearly seen by reference to Fig. 1.

Where electric current is available, undoubtedly the best drive is obtained by direct coupling a small high-speed motor, in the manner shown in Fig. 2, the motor being balanced as shown in the line drawing, Fig. 4. This arrangement is very efficient and workable, and eliminates the greater part of the wrist work experienced with the flexible shaft drive. The machine is connected to either motor or flexible shaft by means of a socket with bayonet joint, and a flexible coupling and spline shaft connect the spindle of either the motor or flexible shaft to the driving spindle of the cutter. If electrically driven, the motor can be run off any lighting supply.

The machine itself weighs about 12 lbs., exclusive of the motor or flexible shaft, but it is found quite unnecessary to balance this weight, as the latter provides just the steadying necessary and prevents all inclination to jumping as the tool performs the operation of cutting. The balancing arrangements shown in Figs. 4 and 5 are solely to take the weight of the motor or flexible shaft. In the case of the motor drive, the balancing arrangement, with its counterweight, is carried on a gantry rail, the length of the latter being to suit half the length of the longest propeller to be worked. A motor running about 3,750 revs. per minute, and giving ½ b.h.p. continuously and 1 h.p. for short periods, is found ample to drive the machine, and the weight of such a motor is about 25 or 26 lbs.

In the flexible shaft drive (see Figs. 3 and 5), the shaft, which is about 10 ft. in length, is connected to a driving pulley running in ball bearings and supported on a stand, the bearings being arranged to swivel to give additional range to the flexible shaft. The pulley is 3½ ins. diameter by 2¼-ins. face, and runs at about 3,750 to 4,000 revs. per minute.

On an extension of the spindle which carries the driving pulley an emery wheel is mounted for sharpening the cutter, a hinged tool carrier or bar being bolted on to an extension of the pulley bracket and having a fine screw adjustment. The cutter is moved to and fro on the bar against an adjustable stop.

For sanding, the cutter may be replaced by a drum covered with sandpaper, but the tendency is to obtain a second machine for this purpose, as it is found in practice an advantage to have a larger casing for sanding.

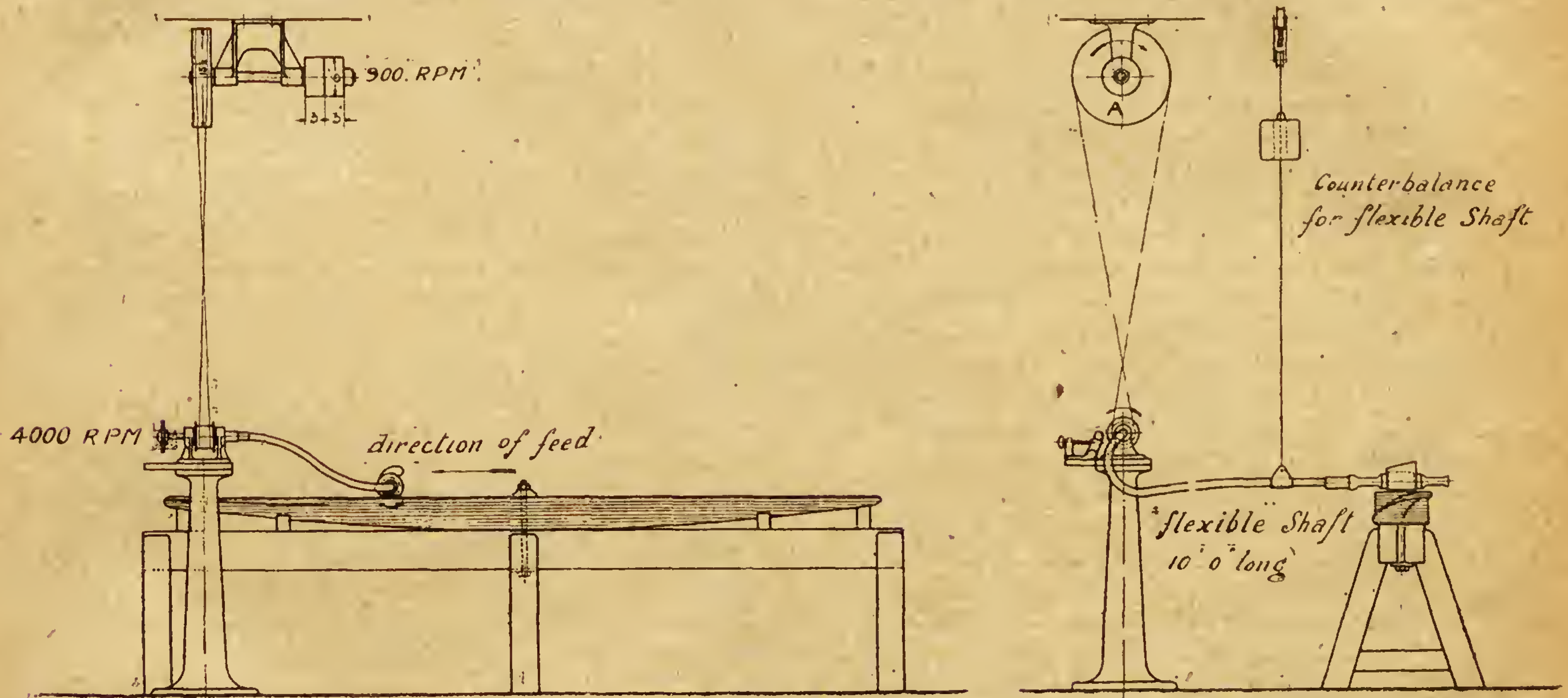


FIG. 5.—SHOWING THE FLEXIBLE SHAFT DRIVE ARRANGEMENT.—The countershaft, A, must be placed directly over the centre of the stand and drive by cross-belt as shown. Belt 1½ ins. wide.

The apparatus will rough out a two-bladed propeller in about two hours; the same work, we understand, takes about one day by hand labour.

The propeller is bolted to a low trestle or stand, enabling the operator to sit astride the work. A gauging table should be provided at the right-hand side, which should be suitably marked for guiding the operator to obtain the shape required.

As to how far the tool can be used for finishing the propeller depends upon the dexterity of the operator, but as a roughing-out tool it is no doubt a considerable acquisition in any aircraft factory.

Its use is not, of course, in any way confined to aircraft work, and its adaptability is almost as extensive as the joiner's spoke-shave on irregular work, especially for furniture requirements in shipbuilding, railway rolling stock construction, school and institute furniture manufacture, &c. It is also useful for flat planing floors, decks, &c. We understand that arrangements have now been made for Messrs. Thomas Robinson and Son to manufacture and market the Rotary Shaping Machine. Applications for further particulars should be sent to this firm.

◆ ◆

Women Workers for Aeroplane Workshops.

In connection with an effort to raise the necessary funds for extensions of the school for training women welders, inaugurated by the Women's Service Bureau, a reception was held on December 5th at 5, Johnson Street, Notting Hill Gate, by permission of the Misses Woodward. The school at Notting Hill Gate now has 20 students, and has prepared over 100 skilled women for aeroplane workshops. Miss M. Lowndes explained that the necessity for the extension of the school was urgent, as the demand for the students exceeded the number that could be supplied with the present facilities. The hostesses of the afternoon were Lady Henderson, who presided, Lady Carden, Lady Loch and Mrs. E. L. Franklin.

◆ ◆

Austrian *v.* Italian Losses.

According to the *Times*, on the Italian front during the last three months 20 Austrian machines have been brought down in aerial combats, whilst only four Italian aeroplanes have been lost.

A Much-Escaped German Pilot.

After brief liberty of two days, Lieut. Otto Thelen, of the German Flying Corps, who escaped from the prisoners' camp at Holyport, Berks, was re-captured at Old Windsor on Sunday night On being captured, Lieut. Thelen said it was the third time he had got away, and he thought he must be unlucky. He had discarded his uniform for a brown suit, and had on him 5*s*. in English money, a map of London, a compass and chocolate.

ARMCHAIR REFLECTIONS

By the "Dreamer"

Once again the time has arrived for me to pen a few words of greeting to my readers. I wish, even as I expressed the same wish a year ago, that this time I could think that the season's greetings so easily spoken or written carried with them the possibility of being consummated to the full.

Unfortunately, this year as last, we have the one-time festive season upon us under conditions such as to make joy and merriment appear but hollow shells.

Some of us there are, no doubt, almost impossible as it seems, who have been little affected in that which touches them most closely. Some there are over whose house the dark angel has hovered with seeming unfair persistency, devastating once happy and prosperous families almost to the extent of extinction.

Just at a period when in times of sanity we should be thinking and preparing for the home-coming of those sons whose livelihood has called them away from the home fold, we are called upon to brace ourselves for the ordeal of bidding them goodby and God-speed on their way to fight for their King and country. Is it possible under such circumstances to wish the old wishes? Does "A Merry Christmas" sound blessingless—the reply a hollow mockery? I think not. I believe that with all the trouble and strife, with all the death and mutilation now rampant throughout the Empire, the old wishes have the same magic power, the reply the same loyalty, as ever.

I have offered my sincere good wishes so many times on this page in happier times, I feel I cannot let the season pass without the usual expression of good will, asking that one and all will accept that it comes from the very bottom of my heart.

If we cannot be entirely happy this Christmas season, as in days gone by, let us at least be as happy as we may, and hope that the time is not so very far distant when we may look upon life as not entirely composed of suffering and sorrow. Every cloud has a silvery lining, and although it may seem difficult to believe in justice and liberty at the present moment, let us believe, and be sure, that they will prevail when the Power that has the shaping of the world's destiny shall think fit and proper. In the meanwhile we are men and women of superior intelligence, and with the fortitude to suffer with equanimity when called upon by some power outside our influence.

Then there are the little ones to consider—those small personages who are so great, in that it will be to them this country will some day have to look for protection. Born into a world of sorrow, they happily are innocent at the moment of the understanding of that which goes to the making of turmoil and strife. Let them have their Christmas tree. Let that old impostor Santa Claus go his stealthy round of little cots, filling up little stockings with good things, the while rosy-faced boys and girls sleep with one eye open to defeat his admirable intentions. And if a tear should fall, as no doubt it will and should, at thoughts of long-past little stockings, and little boys grown big, try to comfort ourselves with the thought that this is as it must be—that this old world cannot stand still, that things must come and pass away, and be gone for ever. That even you who are so pleased to enact the old *rôle* of pleasure-bringer must some day bring sorrow at your passing. It is progress. It is evolution. It is life. So while we live, let us be happy as we may be. And so a Merry Christmas and a Happy New Year to one and all.

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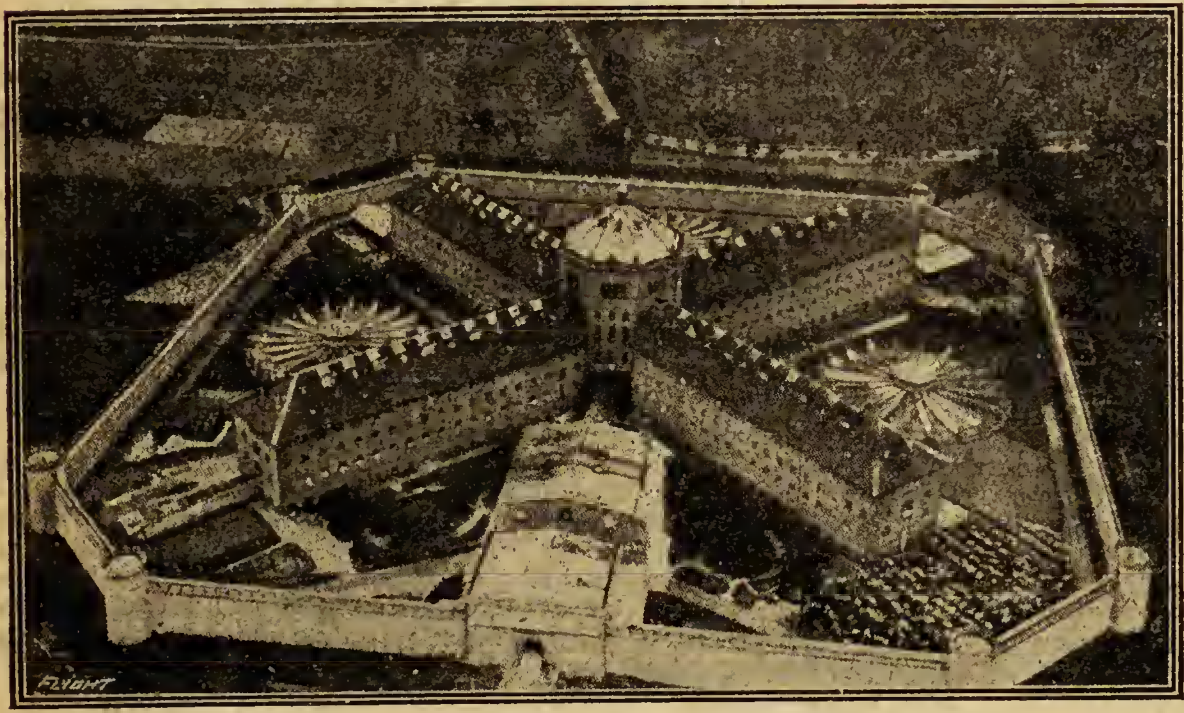


As seen from above, in the land of the Huns.—The Penitentiary at Bruchsal.

ANSWERS TO CORRESPONDENTS.

If in doubt about anything aviatic, write to "FLIGHT" *about it.*

J. W. T. (Eastbourne).

The earliest Zeppelin airships were designed so as to enable them to alight on the surface of the Lake Constance, over which the first trials were conducted. The gondolas were boat-shaped, and so designed that when the airship was barely buoyant, they supported part of the weight, and thus enabled the airship to rest lightly on the surface. It was found, we believe, that considerable difficulties with regard to trim cropped up, and in the latest type Zeppelins, even those employed for sea scouting, there is no attempt at any landing gear whatever. The gondolas have handling rails running along their sides close to the bottom, and when it is desired to effect a landing, this is accomplished by the landing crew, who first catch hold of the tow ropes, and later, when the airship is sufficiently low, of the handling rails, and guide the airship on to the trolleys and rails by means of which she is towed into her shed.

J. J. M. (Byfleet).

It is not possible to calculate exactly the drift coefficient of an actual machine from knowing its behaviour in the same manner that the lift coefficient can be estimated. With regard to lift, this coefficient can be estimated, since only the lift of the wings is considered. When it comes to the drift, however, not only the wings, but all the other parts of the machine such as body, undercarriage, struts, tail planes, &c., offer resistance, and one does not, therefore, know how great a portion of the resistance is due to the wings, and how much is detrimental head resistance. What can be done, however, is to estimate approximately how many square feet normal to the wind the total resistance of a given machine is equivalent to. For instance, suppose a machine is known to be fitted with an engine developing 100 brake h.p., and to fly at 100 m.p.h. The thrust developed, which must obviously be equal to the resistance, can be found approximately from the formula $T = \frac{550 \times H \times Ep}{V}$, where T = thrust in lbs., H = brake h.p. of engine, Ep = efficiency of propeller, expressed as a decimal, and v = the velocity in ft./sec. An efficiency of ·75 will be assumed, as this is a fair average. V = 100 m.p.h. = 146 ft./sec. We can then write: $T = \text{resistance} = \frac{550 \times 100 \times \cdot 75}{146} = 282{\cdot}5$ lbs. The resistance of a flat plate normal to the wind is found from the equation $R = kAV^2$, where R = resistance in lbs., A = area of plate in sq. ft., and V = velocity in m.p.h. k is a constant, the value of which varies somewhat with the size of the plate. We shall take as an average value of k 0·003. The equation can obviously be written, $A = \frac{R}{kV^2} = \frac{282{\cdot}5}{\cdot 003 \times 100^2} = 9{\cdot}4$ sq. ft. approx.

With regard to your second question, it is general practice to include the body in the parts inside the slip-stream, although, as you mention, the inner portion of the propeller arms, for a foot or so out from the boss, does not give any great amount of slip. The majority of *fuselages*, however, are considerably more than 2 ft. in depth, and engine cowls, where rotary engines are concerned, are usually of about 3 ft. diameter, or over. At any rate, there can be no doubt, that the *fuselage* does offer very considerably greater resistance at any speed than it would do had it been outside the slip-stream.

H. E. T. (Bradford).

There are very few figures available on which to base calculation of fin and rudder area. It is determined by the distance behind the centre of gravity of the machine, by the amount of side area of body, undercarriage, struts, wings (owing to dihedral), propeller, &c. It must be large enough to counteract the inherent yawing instability of the body and the yawing effect of the parts mentioned above that may lie in front of the centre of gravity. In his book, "Aeroplane Design," which we can thoroughly recommend, Mr. F. S. Barnwell, now Capt. R.F.C., suggests the following empirical formula: $C\,(s \times d) = S - \frac{S \times D}{2} + A$, where s = area of rudder in sq. ft., d = distance of centre of area of rudder from centre of gravity of machine, in ft., S = area of side elevation of body, aerofoils, landing gear, and propeller, in sq. ft., D = distance of centre of this area S *behind* the centre of gravity, A = area of wings, in sq. ft., and C = a constant, the value of which for tractors Mr. Barnwell gives as 1·7. Some designers place the tail plane of a "pusher" in line with the centre of thrust, while others prefer to have it some 6 in. above the line of thrust, the object of the latter disposition being, we believe, to partly counteract any effect due to the fact that the tail plane works in the down draught from the wings. So far as we are aware, the book you mention has not yet been published. The best books dealing with wing section and body resistance data are *Nouvelles Recherches sur la Resistance de l'Air*, by Mons. G. Eiffel, published by Dunod and Pinat, Paris, which can be obtained through "FLIGHT" offices at £2 5s., and the *Technical Report of the Advisory Committee for Aeronautics*, 1912–13, which can also be obtained from our offices at 10s. 6*d*., post free.

H. B. (Fareham).

1. Through the R.F.C. Cadet Corps. 2. Either. 3. You are hardly likely to get a commission unless you have had military experience. Apply to the Directorate of Military Aeronautics, Adastral House, E.C., for the necessary forms. 4. No. The R.F.C., if you are accepted, will train you.

J. E. (St. Albans).

The "wings" are only worn by a pilot who has passed all the tests. In your case therefore you would not be entitled to wear them.

Novice (Wood Green).

1. No; when on duty you must salute every officer (naval and military) senior to yourself. 2. Yes. 3. Some of the schools are controlled and some are not.

Contact (Richmond).

For the R.F.C., you should obtain the necessary form from the Directorate of Military Aeronautics, Adastral House, and for the R.N.A.S. from the Admiralty. You would probably have to wait another year, and in the meantime had better continue in your present position.

A. R. J. W. (Leytonstone).

There is no such book published. Vickers biplanes are mostly "pushers," but there are Vickers "tractors."

M. M. (Norfolk).

Space does not permit of giving the training in complete detail. You could obtain full particulars from Adastral House. Of the examples you give, the first officer is in the R.F.C., Special Reserve, having entered as a civilian; while the second is an Army officer, seconded from the Wiltshire Regiment to serve with the R.F.C. That also answers your fourth question.

F. W. L. (Ashford).

It is impossible to say definitely, as your sketch is not very clear. Apparently the machine is a large Sopwith. The attachment is a light skid to protect the ends of the planes when landing.

W. A. (Halifax).

1. First obtain commanding officer's permission, then get form from the Admiralty, and when filled up send it to the Director of Air Services, Admiralty, S.W. 2. No. 3. Not so far as we are aware. 4. It depends entirely upon himself.

C. E. S. (Gainsboro').

We can only suggest that you should write to Major Mitchell, The Polytechnic, Regent Street, London, W., giving full particulars and asking if there are any vacancies.

AIRISMS FROM THE FOUR WINDS

Much as the loss by fire of the Princess Theatre, Crayford, is to be deplored, its very destruction gives yet another opportunity for Messrs. Vickers to show their determination to cater for the wholesome recreation of their employees. The work of reconstruction was at once decided upon, and, moreover, the interest of Princess Christian, who laid the foundation stone and performed the opening ceremony of the original structure, is so personal in the welfare of the workers, that Her Royal Highness has already passed her word to repeat the ceremony the moment opportunity serves.

* * *

There is just a small silver lining to the cloud—a café, which was part of the "theatre" scheme, was not included in the conflagration, and this is still available for its original functions.

* * *

By way of a first contribution to the Royal Aero Club Flying Services Fund, as a result of the royalty on sales of the book of the War Letters of the late Flight Lieut. Harold Rosher, R.N., entitled "In the Royal Naval Air Service," Messrs. Chatto and Windus, the publishers, have sent along a cheque for £50, and a like sum to Mrs. Murray Sueter's R.N.A.S. Comforts Fund.

* * *

Possibly, so as to be in active sympathy with the mishaps to the Zeppelin Airship raiders over here who never got back, Count Zeppelin himself has also, it is reported had another bad breakdown. *His*, fortunately for him, happened in the surroundings of his villa on the banks of Lake Constance. What, probably, has upset His Countship more than anything is the unkind, not to say brutal, things which certain Germanic newspapers have said as to the ineffectiveness of his pet air-strafers. His proud spirit is hardly likely to be touched by any consideration for the personal disaster element.

* * *

The Count should buck up, and look out for some good sport in the near future, by reason of the latest report from Paris, which credits our Allies with having devised an unpleasantly effective method of advancing the destruction of these air-pirates, almost to a certainty, once they get within range of this anti-"weapon." We are by way of thinking that we might lay in a stock this side also.

* * *

Lady Henderson, the wife of Sir David Henderson, the Director-General of Military Aeronautics, is one of the most strenuous and practical leaders in war work for women. Last week Lady Henderson presided at the meeting of the Women's Service at the Oxy-Acetylene Workshop at Notting Hill Gate, and there was much enthusiasm at the remarkable progress achieved by the helpers in this particular employment. What would, we wonder, have been said a year or so back had it been even mooted that women should take up work of this character? Yet here we have the whole of the tricky operations being carried out by war working women, whose methods might well be studied closely by those who count themselves expert in this particular direction.

* * *

As might be expected, the much-discussed correspondence by Mr. Prevost Battersby in the *Observer* some little time ago, in which he suggested the cessation of all aircraft warfare in the future, has got across to Germany, where it is reproduced in an aviation journal. The article is headed "England's Fear of German Air Power." After printing Mr. Prevost Battersby's letter, and the article by "C.W.," in reply to it, the comment of the German paper is as follows: "This is probably the first time that England has so plainly acknowledged the superiority of German air power over English. Nobody shall fly, so long as anybody knows how to do so better than the English! Let all nations be lulled to sleep, and then at last England will fly better than anybody else. Then Mr. Battersby would be the first to shriek at the top of his voice, 'Of course, we must fly.' This is not the main thing, however, in the discussion in the *Observer.* Whatsoever may be the pros. and cons., the main thing is that they *are* discussed, and this fact,

Lieut. Louis Noel, of Salonica-Sofia-Bucharest fame, and the Hendon pilot of other days, amongst a few old friends at Charing Cross on Tuesday last, just before returning to his flying duties. He is holding his God-child, son of the late J. B. Manio.

therefore, discloses how deep the thorn of fear of German air raids has stuck in the flesh of the English people. Moreover, this discussion nullifies the denials of German successes in the air, as evidently the bombs hit something besides lonely ponds, ramshackle wooden sheds, and lame cab horses; and when the anti-aircraft defences of Lord French fail, the English are not ashamed to venture to add another to the already oft-repeated, multitudinous, terms of peace— which frequently border on insanity—that of prohibiting all flying."

For a nation that prides itself on having bred some super-philosophers, these comments show a curious lack of understanding of English psychology. Perhaps the writer has altered his views in the light of more recent happenings.

* * *

Lieut. Louis Noel left London last Tuesday for his native land, where he intends to spend the last few days of his short, but well-earned, rest prior to resuming his effective programme of Boche strafing. There was a small gathering of personal friends to see him off from Charing Cross, and wish him God-speed, and although "Our" Noel looked well and hearty, all felt that "another little rest wouldn't do him any harm," for he has had a hard time of it out at Salonica. Well, give them a good extra strafing this time, Louis, and hurry back again to us soon. By way of God-speed, we gave him a hearty wish on behalf of the whole of the readers of "Flight" for a speedy and safe campaign.

* * *

In case "P.B.'s" business man—or is he his own B.M.?—has not already received Lord Justice Darling's subscription to *The Imperialist*, he might send in his claim to lift the regulation eight shillings forthwith, to that end. We would suggest that a contract may easily be held to exist, upon formal acceptance of His Lordship's offer last week to counsel, in the Godfrey Isaacs-Marconi-Jackson blackmail case: "If you could show me a paper without advertisements, I would subscribe to it." It should be a certainty. As Lord Justice Darling in the same case showed his impartiality for acknowledging a "higher legal authority," we feel sure he will in the same sense accept our version in this case as to the law of contract, and at once help to swell *The Imperialist's* subscribers list, always provided His Lordship does not hold that the entire publication is but an advert. for P.B. himself. N.B.—Any legal como. attaching to this introduction, please credit to one of *The Imperialist* benefit funds.

* * *

If you have tried recently to tie up a parcel with newspapers, perhaps you will be wondering with us what the exact proceeding was in the tying-up process of the two German officer prisoners of war, one of whom was Lieut. Otto Thelen, of the German Flying Corps—by themselves! The method adopted, as described, is not *very* convincing, but as the pair of adventurers appear to have got free, we can only conclude that they must be amateur rivals in a reverse sense to some of the knot untying experts, who flourished in places of entertainment a decade or so ago. At the official inquiry, the story runs that "the two officers hid themselves in a shed in the detention grounds in which waste paper was stored. They covered themselves up, and to get air used a stick of elderwood, from which they had removed the pith. The stick just emerged from the heap of paper. Late in the day two orderlies with barrows arrived at the shed to take the waste paper away. The officers went into the barrows, and were wheeled past the sentries to a place where they made their escape.

"The inquiry was adjourned."

And we're not surprised at it. An inducement to duplicate their performance before witnesses might be held out, in the form of a promise of mitigated punishment for their attempt to escape. There's money in it.

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal*) *of December*, 1906. "Flight" *was founded in* 1908.

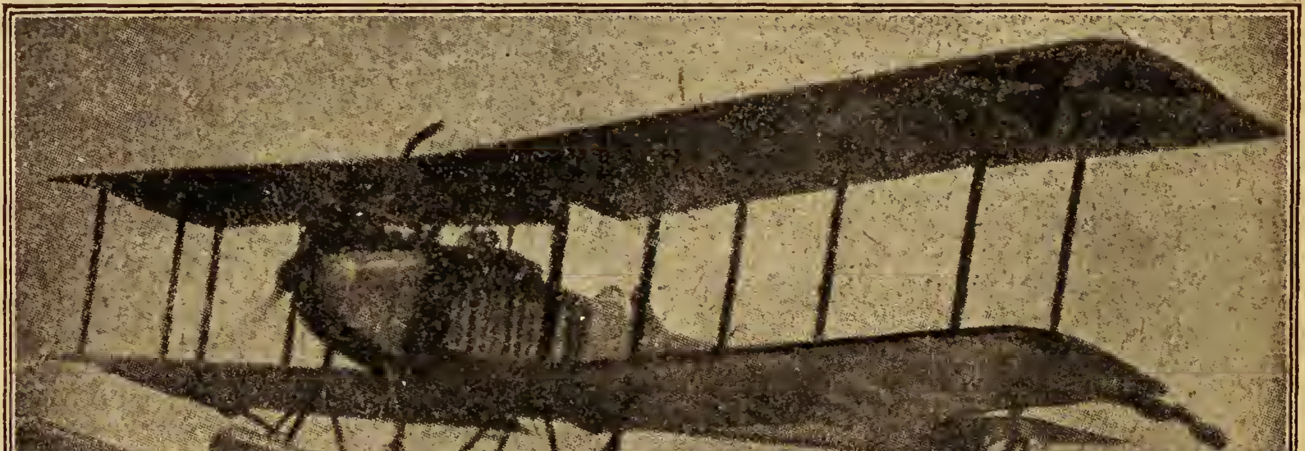
Confirmation of the Wright Brothers' Claim.

The leading event of the past week in connection with aeronautics is not perhaps in the strict sense of the word an event at all, but it is at any rate an occurrence of the very greatest general interest. We refer, it is almost needless to say, to the interview which a representative of the *Daily Mail* has had with one of the Wright Brothers, and apparently also with other persons in a position to give him reliable information regarding the negotiations which are going on, and are stated to be practically complete, between the two famous experimenters and the Government of the United States.

Among the most interesting of the remarks Mr. Orville Wright made was that managing the aeroplane was really no harder than riding a bicycle, and that he could teach any young man to do it within three days. He added that when control was obtained, the machine was quite devoid of danger, as that even when the engine stopped from any cause, one could always glide to earth easily and gradually, as occurred on one occasion when the motor was brought to a stop by a hot bearing. Though some distance away from the shed where it was housed, Mr. Wright was able to glide down at a small angle, and alight close to the shed door.

Substantial Prizes for Aeroplane Models.

The *Daily Mail* has added to its munificent offer of the £10,000 prize, £250 to be awarded in three prizes for working models of aeroplanes, to be exhibited at the Aero Club's exhibit of aeronautical appliances, Messrs. Cordingley's Motor Show at the Agricultural Hall, in the spring, when they will be practically tested by the Club. As pointed out by us editorially in drawing attention to the subject, this offer should have a very beneficial effect in stimulating invention and enterprise in design, and providing inventors with some, at any rate, of the sinews of war to enable them to carry their investigations further.



OFF!—A German (Gotha) seaplane starting on a reconnaissance flight. Note the long stepped floats which project backwards to a point considerably behind the pilot's seat.

Personals

Casualties.

Flight Sub-Lieutenant the Hon. Arthur Cameron Corbett, R.N., killed on service, whose death is announced, was the second son of Lord Rowallan and was born in March, 1898. He had seniority as flight sub-lieutenant of June 11th of this year. The elder son of Lord Rowallan, the Hon. Thomas Godfrey Polson Corbett, holds a commission in the Yeomanry.

Captain Leslie Oakes Crowther, Flight Commander, R.F.C., who has been killed in action, was the second son of Mr. and Mrs. H. O. Crowther, of Broadclyst, Beckenham, Kent. Born in 1891, he was educated at St. Andrew's, Eastbourne, and Malvern College, afterwards spending for educational purposes two years in New York and Dresden. Captain Crowther joined the Royal West Kent Regiment in September, 1914, and in December, 1915, transferred to the R.F.C. For many months he had been stationed at the Front, where he engaged in many thrilling air fights and bomb-dropping expeditions.

Second-Lieutenant Arthur Patrick Donnell, Northumberland Fusiliers, attached R.F.C. (killed in an aeroplane accident on December 4th), was third son of the Rev. and Mrs. C. E. Donnell, Stamfordham Vicarage, Newcastle-on-Tyne. He received his commission in April of this year, and was appointed flying officer in the following July.

Second-Lieutenant Derek Sivewright Johnson, R.F.C., who was killed on December 4th, aged 21, was the youngest son of Colonel Frank Johnson, Royal Sussex Regiment, and of Mrs. Johnson, of Melrose House, Hove.

Lieutenant Ernest Conway Lansdale, A.S.C., attached R.F.C., is officially reported to have died whilst a prisoner of war. Aged 21 years, he was the elder son of Captain E. E. Lansdale, A.S.C., of Hawthorn Villas, The Grove, Ilkley. Lieutenant Lansdale was educated at Ilkley Grammar School, and was in Denmark when the war broke out.

Second-Lieutenant H. E. Martin, R.F.C., killed November 16th, age 23, was the youngest son of Mr. and Mrs. A. A. Martin, of Lower Addiscombe, Croydon. He took his pilot's certificate at Hendon in June this year, and was given a commission in the R.F.C. on August 1st. He obtained his wings early in September, and went to the Front on October 28th. He was an ardent motor cyclist, and well known in athletic circles.

Flight Sub-Lieutenant A. T. Osborne Mann, R.N.A.S. (killed in a flying accident on November 29th), was the second son of Mr. James Elliott Mann and Mrs. Mann, of Sydney, New South Wales. He was born in 1892, and educated at St. Ignatius College, Lane Core River, Sydney. He came to England in October, 1915, and obtained a commission in the Royal Naval Air Service. He took part in several raids and in attacks on Zeppelins.

Lieutenant J. M. J. Spencer, R.F.C., who has been killed in action, was the second son of Mr. and Mrs. R. E. E. Spencer, Walbottle Hall, Newburn, Northumberland. Twenty years of age, he was educated at Alnmouth and Clifton College and was about to enter King's College, Cambridge, when war broke out. He enlisted as a gunner in the Northumberland Artillery, afterwards obtaining a commission in the Northumberland Fusiliers, receiving his second star in 1915. Lieutenant Spencer transferred to the Royal Flying Corps in July of this year, and went to the Front in September.

Lieutenant Victor Strauss, R.F.C., who has been killed in action, was the son of Mr. Arthur Strauss, head of the firm of A. Strauss and Co., tin and copper merchants, Rood Lane, E.C., who has represented the North Division of Paddington in the House of Commons since 1910, and who was formerly M.P. for the Camborne Division of Cornwall.

Flight-Commander Thomas Atkinson Tillard, Yeomanry and R.F.C. (killed on active service on December 6th), was the younger son of the late Algernon Tillard and Mrs. Bonham Carter, of Adhurst St. Mary, Petersfield. Flight-Commander Tillard, who was thirty-two years of age, had his commission in the Yeomanry in October, 1914, and transferring to the Flying Corps, was gazetted flying officer in March of this year.

Wounded.

Second-Lieutenant Charles Francis Wolley-Dod, Sherwood Foresters, attached R.F.C., wounded, is the second son of Mr. Francis Wolley-Dod, of Edge Hall, Chester, and was born in August, 1892. He got his commission in the regiment mentioned in May last year. The family of Wolley-Dod is a very ancient one. The founder of it, Cadwgan Dot, lived in the time of Henry II., who died in 1189, and his son Hova married the daughter and heiress of the Lord of Edge in Cheshire, obtained one-fourth of the manor, and settled there. His descendants have held the property ever since.

Married and to be Married.

The marriage arranged between Cedric R. Alston, South Lancashire Regiment, attached R.F.C., eldest son of Mr. and Mrs. Rowland Alston, of 96, West Hill, Sydenham, and Margery Lilian, eldest daughter of Dr. and Mrs. H. M. Stewart, of Dyffryn, Dulwich, will take place quietly on January 2nd at St. Stephen's, College Road, Dulwich (Sydenham Hill Station, South-Eastern and Chatham Railway), at 2.30.

The marriage of Captain Emley, R.F.C., and Miss Dorothy Horrocks, Salkeld Hall, will take place at Addingham Church on December 28th, at 2 p.m.

On December 7th, Robert P. Grimmer, the son of the late Robert Grimmer, of Wisbech, was married to Ida Mary Howes, daughter of William Joshua Howes, of Norwich, at St. Martin's Church, West Ealing.

The marriage arranged between Ronald St. Clair McClintock, R.F.A. and R.F.C., and Miss Molly Laird will take place at 2.30 on December 20th, at the Church of the Holy Trinity, Kensington Gore, S.W.

Items.

It has been ascertained that Lieutenant A. J. Evans, R.F.C., is a prisoner in Germany. Lieutenant A. J. Evans, who was "posted" as missing some time ago, won great distinction in cricket for Winchester, Oxford, and Hampshire. He was captain at Oxford in 1911.

Second-Lieutenant H. B. O. Mitchell, M.C., R.F.C., officially reported missing, is now known to be a prisoner of war at Dusseldorf. He is the eldest son of Mr. and Mrs. Henry Mitchell, St. Winifred's, Coleraine, and was educated at Coleraine Academical Institution and Trinity College, Dublin.

* * *

Photographers for the R.F.C.

Skilled photographers, with a thorough knowledge of developing, bromide printing, and enlarging, combined with sound technical knowledge and speed, are required for immediate service in the R.F.C. Applicants who possess the above qualifications and are fit for general service or garrison service abroad, should in the first instance apply in writing, enclosing copies of testimonials, to Mr. Hutchison, Central London Recruiting Depôt, Whitehall, London, S.W. They will be required to pass a trade test before acceptance. It should be noted that operators are not required.

A Japanese Pilot Killed.

Lieut. K. Higuchi, a Japanese military pilot, attached to the Tokorozawa Aviation Corps, was killed on October 18th, soon after starting on a flight. He had reached a height of 2,500 metres, when his machine appeared to break, and crash to the ground. Four days before he had flown 250 miles.

Japanese Anti-Aircraft Training.

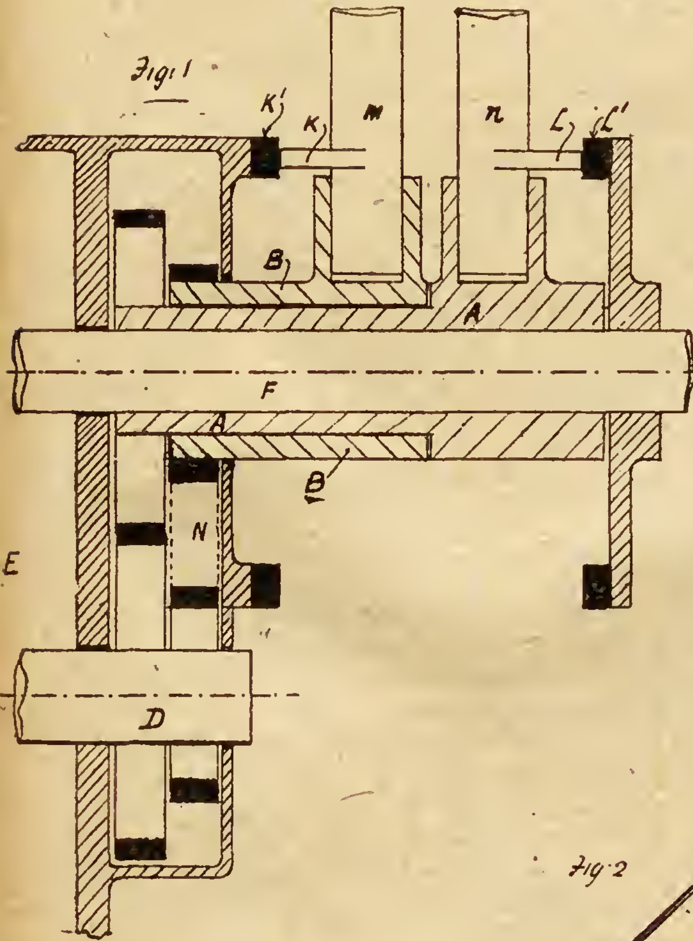
The Japanese *Aeronautic World* states that the military authorities have recently acquired a plot of ground located in Kametsuri, Yama, Toyama prefecture, where soldiers will be trained in shooting at aeroplanes.

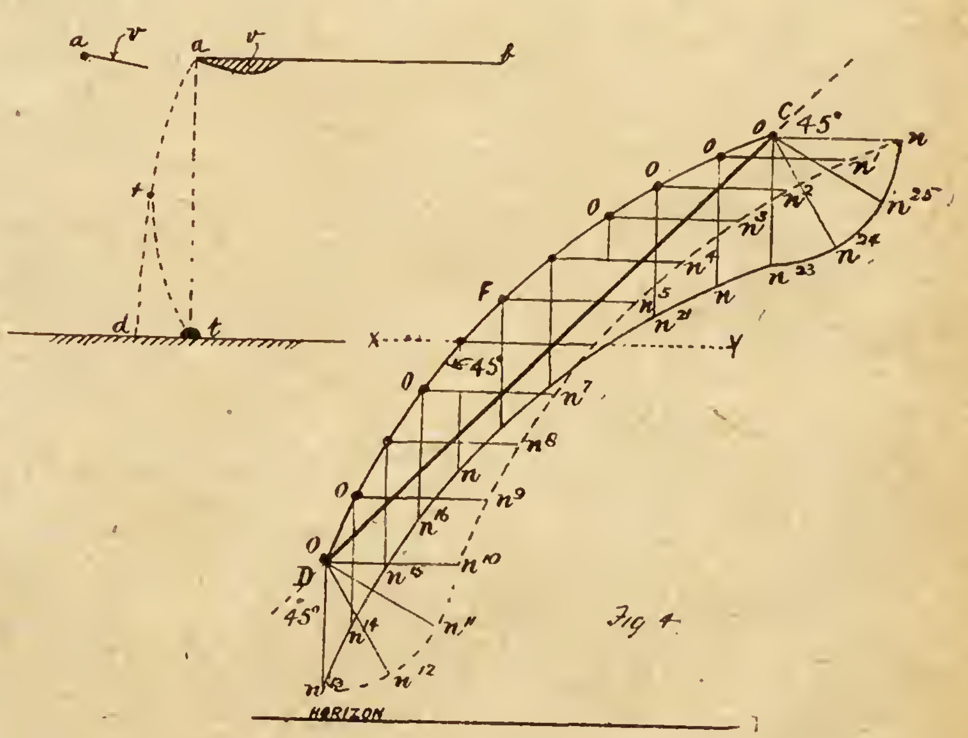
CORRESPONDENCE.

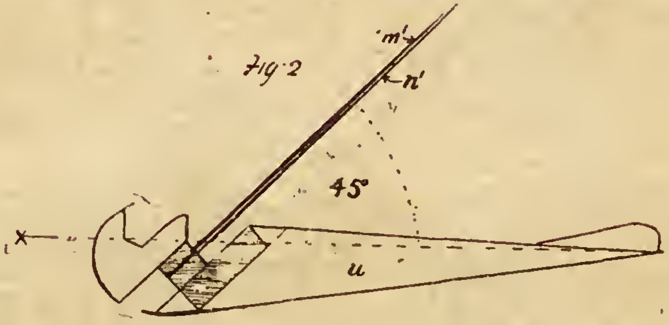
A Rotary Equivalent to Wing-Flapping.

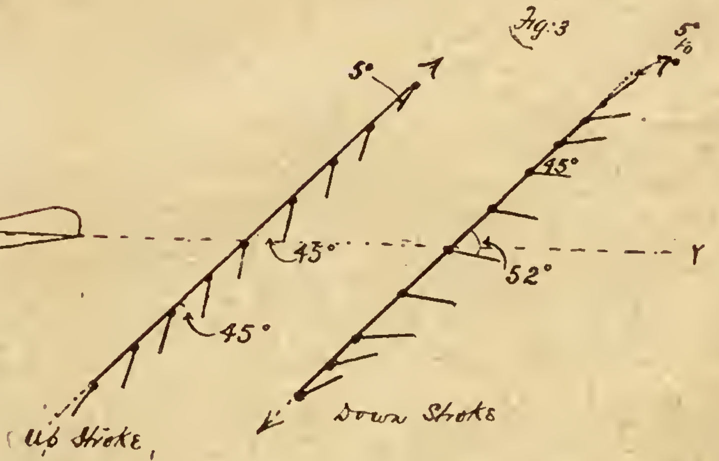
[1931] With reference to the note on M. Passat's wing-flapping machine, in your issue of September 14th. the bulk of experiment certainly appears to lie in detail improvement of existing design rather than in developing original types of machine, but I do not think the rapid reciprocation of artificial wing vanes is as yet practicable on full size machines; it is, of course, unnecessary since artificial wing mechanisms do not suffer from the limitation of arteries crossing the joint and can be made to flap by rotation as well as by reciprocation.

Two single-bladed or vaned propellers superimposed and rotating in opposite directions at equal speeds when correctly mounted and feathered will reproduce quite well the wing motion of the numerically largest class of wing-flappers—the insects.









The arrangement is broadly as follows:—A radial type engine E drives two tubular shafts A and B, Fig. 1, concentrically mounted on a fixed central shaft F which is secured to the engine crank case. The crank-shaft D drives shaft A in one direction by a spur pinion, and shaft B in the opposite direction by a silent chain N. Two vanes or wings m^1 and n^1 are carried by wing spars m and n fixed so as to have axial movement in sockets on the shafts A and B. Each spar has a short lever arm, K and L respectively, the outer ends of which bear on corresponding cam plates K^1 and L^1. The steepness of the cams need not be more abrupt than 1 in 8. Attached to the cam plate L^1 is a body or fuselage (u, Fig. 2) of such leverage that when the said body is horizontal the engines, shafts, wings and cam plates are inclined at about 45 degrees from the horizontal, and the plane of rotation of the wings cuts the horizontal at about the same angle.

Starting with the two wings together (practically superimposed) at the highest position above the body, each wing makes a forward and downward stroke on one side of the body and then continues its movement as an upwards and backwards stroke on the opposite side of the body. The wings, therefore, cross at top and bottom of strokes. During their movement the wings are feathered by the passage of the lever arms over the fixed cams and in the following manner. Where the wings cross they are practically parallel to the plane of rotation and thus do not collide with one another, but as each wing moves on its downward stroke, Fig. 3, it is feathered with a gradual increase of inclination till at about half-way the vane is horizontal, *i.e.*, it has been feathered so that it is inclined at 45 degrees to the plane of rotation. At about ⅝ stroke the feathering is gradually decreased so that the vanes may again cross at the bottom of the stroke. On the up-stroke the vanes are feathered so that they are practically vertical on most of the stroke. The downward and forward stroke is therefore almost wholly a lifting stroke, and the upward and backward propels the machine. At the crossing points the wings are inclined at about 5 degrees to the plane of rotation, so that at both these parts of each revolution there is both lift and propulsion.

This general system of feathering may be inferred from the figure of 8 movement so characteristic of insect flight and from the following observations.

Let a flexible rod ab, having a vane v, be struck with uniform velocity vertically downwards at an object t, the vane being held at a small positive angle to the horizontal. The rod tip a will follow the path ad reaching the ground at a point d in advance of the object, the deflection being due to air reaction on the vane. If the rod be accelerated to maximum velocity at mid stroke r and have minimum velocity at a and d, the tip will follow a curved path, a, r, t, and a similar curve to this can be obtained at uniform velocity by feathering the vane as shown in Fig. 3 at different parts of the stroke.

The reciprocating wing of an insect corresponds roughly to the vaned rod in having a maximum velocity and feathering at mid stroke, but the wing stroke is made downwards and forwards as *CD*, Fig. 4, and the path followed by the wing tip is similarly *CFD*. Then if *On* be the plane part of the wing, *O* being the leading edge and *n* the trailing edge all in section, the downwards and forwards stroke may be shown at various points as On, On^1, On^2 . . . On^{10}. On reaching this point, which represents the bottom of the stroke, the wing leading edge is momentarily almost at rest while the vane of the wing swings down to the position On^{13}, keeping the same vane angle to the line of stroke as on the down stroke, the up stroke is now made and various positions are shown at On^{14}, On^{13} . . . On^{23}, at which point the top of the stroke is reached and the leading edge halts while the vane swings through On^{24}, On^{25}, to the starting position *On*.

The vane of a wing therefore swings through an angle of 90 degrees in making a full up and down stroke, but the feathering described can only refer to a general form of insect wing motion, and the geometrical construction shown is in nature varied by the elasticity of the wing structure. If the path of the trailing edge *n* be followed through n^1 n^2 . . . n^{13}, and thence again to *n*, it will be seen that the trailing edge describes in space a figure of 8 which is due solely to the feathering employed and requires no special mechanism to produce.

In the rotary mechanism herein shown let one of the wings be feathered on the down stroke till it is horizontal. Then without any change of feathering the same wing on the up stroke will be vertical. Therefore to obtain a similar feathering on down and upstrokes to that described in Fig. 4 the maximum feathering angle is but 45 degrees. With both wings moving this angle as previously mentioned must be lessened to 5 degrees at top and bottom stroke so that the wings do not collide on crossing.

The curved path *CFD* of Fig. 4 is a consequence of uniform velocity and varying feathering in rotary wings. Therefore, any one wing trailing edge will describe in space one half (that shown in broken line) of a figure of 8 while making a downward and forward stroke during one half revolution, and the corresponding half 8 during the upward and backward stroke of the succeeding half revolution. With two wings a complete 8 must therefore be formed simultaneously on each side of the body, and with 1,000 r.p.m. the effect will be similar to that given by a flapping insect wing. The advantages over the natural wing type are the absence of reversal stresses and the utilising of the full revolution for useful work.

The usual means of control can be used with this construction, and a variable feathering can be obtained if the cam races on the cam plates are formed of laminated spring leaves having levers in rear so as to cause a hump or cam contour where desired.

Even with wings of 10 ft. length the ground clearance or landing chassis height corresponds to ordinary practice, since approximately 7 ft. vertical height would allow free play for the inclined stroke of the wings.

To convert the idea contained herein to a truly practical conclusion would require the solving of many difficult problems of control, but the evolution of the conventional aeroplane was by no royal road. I would be very glad to know of any experimental work carried out and bearing on the above.

"Aerostat."

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THE ROLL OF HONOUR.

Reported by the Admiralty:—

Killed.

Flight Sub-Lieut. the Hon. Arthur C. Corbett, R.N.

Accidentally Killed.

Flight Sub-Lieut. Alfred T. O. Mann, R.N.

Died of Injuries.

Flight Sub-Lieut. Neville W. Frames, R.N.

Missing (believed Killed).

Lieut. Percy M. Woodland, R.N.V.R.
Flight Sub-Lieut. Alfred J. Nightingale, R.N.

Missing.

Flight Lieut. Edward J. Cooper, R.N.
Lieut. Lord Torrington, R.N.V.R.
Flight Sub-Lieut. Charles W. Greig, R.N.
Flight Sub-Lieut. Guy L. Davies, R.N.
Flight Sub-Lieut. Charles T. Brimer, R.N.
Sub-Lieut. Rowland W. Frazier, R.N.V.R.
Sub-Lieut. Alick C. Stevens, R.N.V.R.

Slightly Wounded.

Flight Sub-Lieut. Geo. S. Abbott, R.N.

Reported by the War Office:—

Died of Wounds.

7600 2nd Air-Mech. E. C. Josling, R.F.C.

Wounded.

Lieut. W. A. Dunn, R.F.C.
2nd Lieut. J. C. Griffiths, R.F.C.
2nd Lieut. P. J. Long, A.S.C., attd. R.F.C.
2nd Lieut. C. F. Wolley-Dod, Sher. Foresters, attd. R.F.C.
6640 1st Air-Mech. H. Alexander, R.F.C.
8656 2nd Air-Mech. W. C. Mann, R.F.C.
15788 1st Air-Mech. T. H. E. Sawyer, R.F.C.

Missing.

2nd Lieut. G. S. Deane, R.F.C.
24130 Sergt. C. G. Baldwin, R.F.C.

Previously reported Missing, now reported Killed.

Lieut, A. H. T. L. Speer, R.F.A. and R.F.C.
2nd Lieut. W. A. Wedgwood, R.E. and R.F.C.

Previously reported Missing, now reported Prisoner of War.

13958 Corpl. W. Summers, R.F.C.

Previously reported Wounded, now reported not Wounded.

2nd Lieut. J. E. Burt, Middlesex, attd. R.F.C.

Now reported Wounded and Prisoners of War in German hands.

Lieut. L. R. Briggs, London Regt. and R.F.C.
Lieut. J. H. Lowsen, R. Scots and R.F.C.

Previously reported Missing, now reported Died as Prisoner of War in German hands.

Lieut. E. C. Lansdale, A.S.C. and R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

Lieut. G. Wadden, R. Irish Fus. and R.F.C.
2nd Lieut. C. L. Roberts, S. Lancs, and R.F.C.

Correction: **Wounded.**

Capt. H. G. Richards, R.F.A., attd. R.F.C., should read 2nd Lieut. H. W. B. Richards, R.F.A., attd. R.F.C.

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Fatal Accidents.

At an inquest on Lieut. H. S. Brewster, Royal Canadians, attd. R.F.C., who was killed on December 6th, while flying, the evidence showed that when at a height of about 200 ft. his machine nose-dived and crashed to earth, Lieut. Brewster being killed instantly. It was thought he attempted to descend too steeply.

A verdict of "Accidental death" was returned.

"Death through misadventure, owing to an error of judgment when about to land," was the verdict at an inquest on Lieut. C. T. Miller, Canadian Regt., attd. R.F.C., who was killed on Friday. According to the evidence the machine was thoroughly explained to the deceased before he ascended. He got to 1,000 ft., did three circuits, and then apparently began to descend. When about 100 yards from the aerodrome he appeared to "stall" the machine, which nosed straight to the ground.

Lieut. G. A. Powell, of the R.F.C., was knocked down by a motor-cyclist on the night of December 8th, near Thetford and received fatal injuries.

A double flying fatality occurred on December 10th. Lieutenants Brooke and Lotinga, R.F.C., soon after ascent, appear to have lost control of the machine, for it was seen to nose-dive to the earth. The aeroplane was smashed, and both aviators were killed.

DYNAMICAL STABILITY OF AEROPLANES.

By JEROME C. HUNSAKER.

(*Concluded from p.* 1081.)

Spiral Dive.

The first factor may correspond either to a damped or to an amplified motion, depending on whether the aeroplane be stable or unstable. At high speeds model S shows a subsidence damped to half amplitude in 10·4 secs. At lower speeds this damping diminishes, and at 37 miles per hour the motion becomes a divergence which doubles in amplitude in 7·2 seconds. Examination of the preponderating terms in the expression representing the motion shows that the aeroplane starts off on a spiral dive. There is a tendency on side-slip or "skid" to the right, for example, for the aeroplane to head to the right toward the relative wind due to vertical fin surfaces on the tail acting as a weathervane. At the same time, due to spin in yaw, the machine banks to the right suitably for a right turn due to greater lift on the left or more rapidly moving wing. The increased bank increases the side-slip, the yaw becomes more rapid and in turn the overbanking is magnified. The aeroplane starts off on a spiral dive, and will spin with constantly increasing angular velocity unless the pilot intervene with his controls.

The spiral dive is corrected if the aeroplane have a preponderance of fin surface above the centre of gravity or if the wing tips be raised. There must be such an arrangement of surfaces that when the aeroplane side-slips to the right it banks suitably for a left turn. Then it will be restored to its normal attitude. A simple relation may be obtained involving four of the aerodynamical coefficients which, if positive, insures that spiral instability of this kind is not present.

It appears that spiral instability is caused by too much fin surface to the rear or too large a rudder, and by not enough fin surface above the centre of gravity. A proper adjustment is easily obtained without sacrifice of desirable flying properties.

The aeroplane S is stable spirally at all reasonable speeds. It has a small rudder and wing tips raised about 1·6°. At extreme low speed (when stalled), there is spiral instability caused by the righting moment due to side-slip becoming small. The effect of the slight dihedral angle of the wings is not of much assistance at large angles of incidence, and it may be preferable to fit true vertical fin surface, whose stabilising effect should be independent of attitude.

Aeroplane U is spirally unstable at high speeds. It has no rise of wing tips nor vertical surface above the centre of gravity, and has a very deep body giving the effect of a rear vertical fin.

Rolling.

The second factor in the equation of motion represents a rolling of the aeroplane which is so heavily damped by the wide-spreading wings as to be ordinarily of no consequence. In the extreme case of a "stalled" aeroplane, the damping of the roll vanishes because the downward moving wing has no more lift than the other. Here we may expect trouble, and frequent accidents to stalled aeroplanes indicate that the pilot's lateral control by *ailerons* also becomes inoperative. For reasonable flying speeds, this factor should not lead to any instability.

Dutch Roll.

The third element in the motion is a yawing to right and left of the course combined with rolling. The motion is oscillatory of period from 5 to 12 seconds, which may or may not be damped. We may imagine an aeroplane which is spirally stable to yaw to the right accidentally. Due to fin surface above the centre of gravity it banks in a manner proper for a right turn, but the roll is resisted by the damping of the wings. The turn is assisted by the increased resistance of the downward moving wing, but eventually the weathercock effect of fin surface at the tail turns it back into the original course. As the machine swings back to her course, the bank flattens out. But, due to angular momentum, she swings out to the left, and banks for a left turn. This swinging to right and left is accompanied by rolling and some side-slipping.

The analogy to the "Dutch Roll" or "Outer Edge" in ice-skating is obvious. If the skater lean too far out on his swings he may fall, and in the same manner if the aeroplane bank too much a slight puff of wind may capsize it.

The motion in the Dutch "Roll" is stable provided there be sufficient vertical fin surface on the tail, and not too much fin surface above the centre of gravity. These requirements conflict with those previously stated for spiral stability, and a compromise must be made. Over-correction of spiral instability may produce instability in the "Dutch Roll" and *vice versa.* Fortunately, the damping of rolling by the wings is helpful in both cases, and it appears possible to obtain that nice adjustment of surfaces which will render both motions stable.

Model S was stable in the "Dutch Roll" at all speeds, having a period from 6 to 12 seconds, and the initial amplitude damped 50 per cent. in from 1·5 to 6 seconds. Model U was stable in this respect at low speed, when it showed a period of 6 seconds and the initial amplitude was doubled in 8 seconds. Here the aeroplane was practically "stalled," and the damping of the roll due to the wings was only one quarter of its value at high speed.

General Conclusions.

It is believed that the majority of modern aeroplanes are spirally unstable, but stable in the Dutch Roll. Furthermore, it appears to be a simple matter so to adjust surfaces that any aeroplane can be made completely stable without sacrifice in speed or climb. At extreme low speed an aeroplane must be unstable in its longitudinal motion, but need not be unstable laterally.

The degree of stability to provide in a given case cannot be determined from mechanical considerations, but certain general conclusions may be indicated. For example, the comfort of the pilot must be the first consideration, and for this reason the righting moments giving statical stability should be small; the period of the aeroplane can then be made relatively slow, and if the damping is adequate the free oscillations will be stable.

The theory is applied here only to flight in still air. Obviously the air is never still, and the aeroplane must finally be judged from its behaviour in gusts. An inherently stable aeroplane tends to preserve its normal attitude with relation to the relative wind, and if the velocity and direction of the relative wind change in an irregular manner, the stable aeroplane will tend to follow in an effort to preserve the same relative air speed and longitudinal attitude. The result will be to force a motion of the aeroplane, which will be more violent the greater the statical stability. Consequently in rough air an aeroplane very stable statically is unsuitable as a gun platform, and for many other military purposes. A machine whose inherent statical stability is slight or nearly neutral should be slow to respond to gusts.

The stable aeroplane, if the pilot abandon his controls, tends to fly in such a manner that the relative air speed and attitude remain constant. In good weather, the pilot may, therefore, abandon his controls at intervals to make observations which ordinarily would require an assistant as observer. However, this very tendency of the machine to adjust its flight path may prove a source of danger when the piolet wishes to make a landing in a small field. Here the machine, if struck by wind gusts, will attempt to "take charge" in resistance to the pilot's efforts to direct it. A very stable aeroplane is not, therefore, so completely under the pilot's control as one whose stability is slight.

For the determination of the degree of stability suitable for

Aeroplane... ...		S.	S.	S.	U.	U.
Wing area	sq. ft.	464·	—	—	384·	—
Span	ft.	40·2	—	—	36·	—
Chord	ft.	5·77	—	—	5·3	—
Weight	lbs.	1600·	—	—	1800·	—
lbs. per sq. ft.		3·55	—	—	5·2	—
Rise of wings		1·63°	—	—	0°	—
Angle of incidence		0°	6°	12°	1°	15·5°
Velocity	miles	76·9	44·6	36·9	78·9	43·6
"Spiral" motion—						
Damp 50 per cent.	secs.	10·4	2·7	—	—	3·3
Double	secs.	—	—	7·2	28·0	—
"Dutch" roll—						
Period	secs.	5·9	10·7	12·0	5·2	5·7
Damp 50 per cent.	secs.	1·4	1·3	6·0	1·8	—
Double	secs.	—	—	—	—	7·7

military aeroplanes we must finally depend upon the preferences of pilots. A knowledge of the natural periods and damping coefficients should then furnish a means for fixing the verdict of experience, so that in future the desired degree of stability may be provided.

Considerations of theory indicate that a slight degree of statical stability combined with the maximum of damping give an aeroplane slow periods of oscillation and a dynamically stable motion, with little ill effect upon performance or controllability.

The table summarises the results obtained for the lateral motion.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *General Headquarters, December 5th,* 10.52 *p.m.*

"Yesterday our aircraft carried out much successful artillery and reconnaissance work, and bombed, among other objectives, a railway station and an aerodrome.

"The Naval Air Squadron had many combats, and were most successful, driving down two hostile machines out of control and forcing seven others to land. In all two hostile machines were destroyed and four driven down out of control, in addition to those forced to land. One of our machines is missing."

War Office, December 8th.

"*Tigris Front.*—On Dec. 4th hostile aeroplanes bombed our camps. In retaliation a flight of six British machines dropped half a ton of explosives on Turkish camps, and caused considerable damage."

French. *Paris, December 5th.*

"Yesterday Second-Lieut. Nungesser successively brought down on the Somme front two German machines, the first at 12.15 p.m. and the second at 1.5 p.m. One of the machines came crashing to the ground 300 metres west of Nurla. The other fell in flames in the Vallulart Wood, east of Lechelle. These two successes bring the number of enemy machines forced down by Second-Lieut. Nungesser to twenty."

Paris, December 6th.

"It is confirmed that Adjutant Dorme brought down on the 4th inst. his seventeenth enemy aeroplane. The machine fell from a height of 600 metres, near Mons-en-Chaussée (south-east of Péronne). The same day Qr.-Mr.-Sergt. Viallet brought down his seventh enemy aeroplane, which fell from a height of 700 metres, east of Beugny (in the region of Arras.)."

Paris, December 10th.

"On the night of Dec. 9th, one of our aeroplane detachments dropped many bombs on the railway stations and military establishment of Martigny, Ham, and Mons in Chaussée."

Paris, December 11th.

"During the day (yesterday) two German aeroplanes were brought down by our pilots on the Verdun front. One of them fell in flames near Brabant-sur-Meuse, the other crashed to the ground near Herneville. Our aviators fought several battles on the Champagne front yesterday, in the course of which Pilot Sergt. Sauvage brought down his seventh German machine, which fell in flames south of Monthois. The second enemy machine was brought down on the northern edge of the Bois d'Autry.

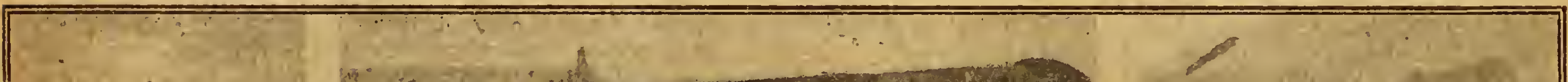
"Last night our bombarding aeroplanes dropped a number of projectiles on the enemy's munition dumps in the region north of Verdun. Several fires and powerful explosions were observed. Enemy cantonments at Romagne-sous-les-Cotes were also bombarded."

Russian. *Petrograd, December 9th.*

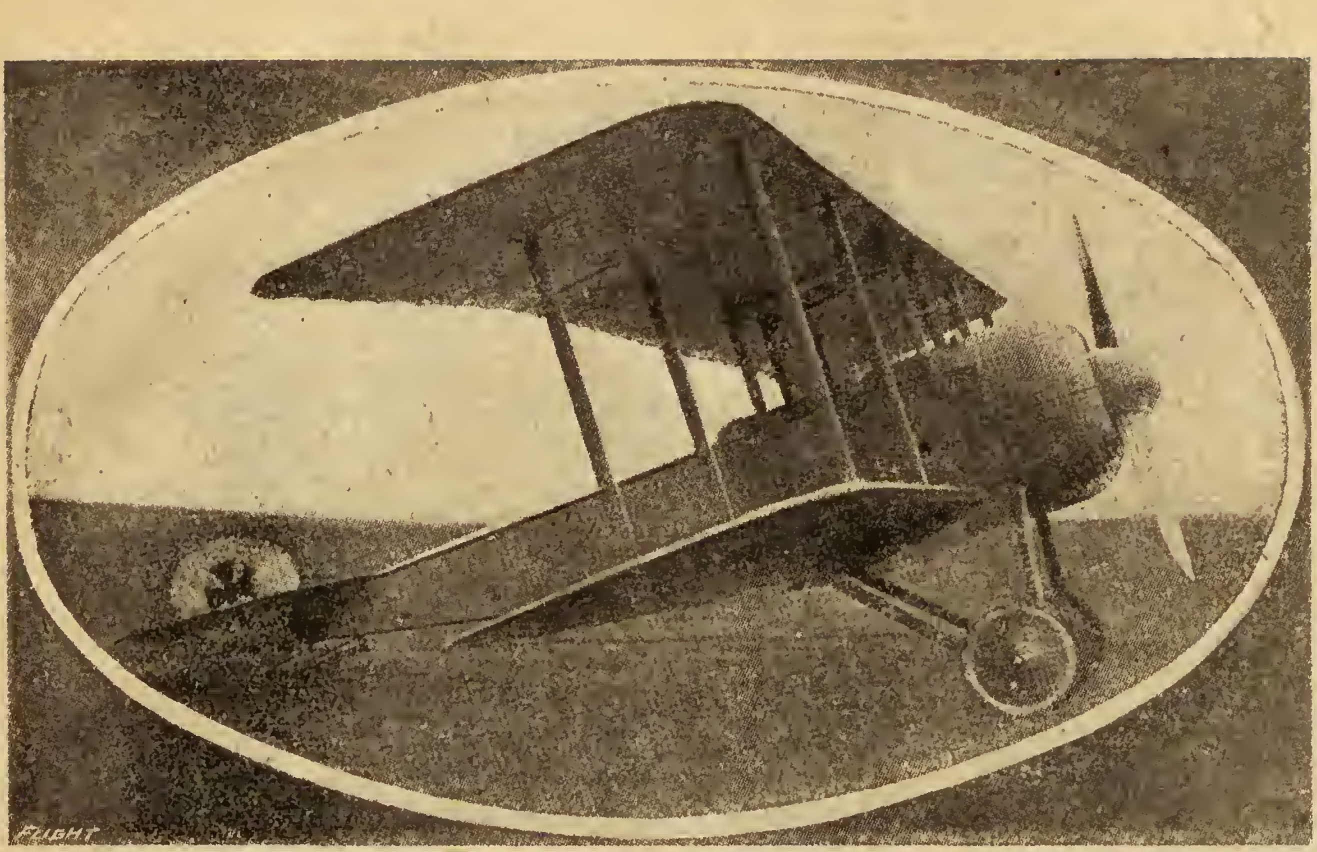
"*Western Front.*—Near the little place Pelikana, south of Lake Drisviata, a German aeroplane was brought down by our machine-gun fire. On descending the aeroplane overturned, and received considerable damage. The pilot and observer were taken prisoners."

Petrograd, December 10th.

"*Western Front.*—In an aerial combat in the region north of Dvinsk one of our aeroplanes came down in the vicinity of the Kolub Lake (16 miles north of Dvinsk). The machine was smashed, but the aviators escaped injury. Another



THREE GERMAN ALBATROS BIPLANES.—In the top photograph is shown a reconnaissance two-seater, having the radiator mounted above the engine, while below, the machine on the left is of the older type, with the radiators on each side of the body. The right hand photo. is of special interest as it shows the body of an Albatros which returned from a fight with Garros with twenty bullet holes through various parts of the *fuselage*.



A German Ago Biplane.—This machine, which is now, we believe, no longer used, is very similar to some of our own tractors, with its rotary (Oberursel) engine all covered in.

aerial engagement took place in the region of Illukst, as the result of which a German Fokker was hit and fell to earth almost perpendicularly. Our aeroplane, after accomplishing its prearranged reconnaissance, returned safely, notwithstanding the fact that the machine was pierced with numerous bullet holes."

Italian. *Rome, December 5th.*

"Hostile aircraft dropped a few bombs on Adria and Monfalcone without doing any damage."

Rome, December 7th.

"Enemy aeroplanes dropped bombs in the Aquileia district, killing a woman, and wounding a child. Our aeroplanes bombed the enemy aviation sheds at Prosecco and the floating hangars on the Trieste pier with marked success, as a reprisal. They returned safely to our lines."

German. *Berlin, December 8th.*

"In spite of the generally unfavourable weather great successes were obtained during November by our air service. Our own losses of thirty-one aeroplanes in the west and east, in Roumania, and in the Balkans are balanced by the following enemy numbers :—

Lost in aerial battles	71
Shot down from the earth	16
Involuntary landings	7
Total	94

"Of these, 42 are in our possession, and 52 were observed to fall down on the other side of the lines. The aviators, both of the artillery and infantry, gained for themselves, by the very excellent execution of their important tasks, the recognition and confidence of the other troops. Headquarters highly appreciates their achievements."

Berlin, December 11th.

"On the Verdun front during aerial fighting seven enemy planes were brought down by anti-aircraft guns and by our machines."

Austrian. *Vienna, December 4th.*

"Italian air squadrons unsuccessfully bombed Dutoolje, Grossrepen, and Sesana. Our airmen attacked the enemy, and forced a Caproni machine, with its four occupants, to land near Mayhinje. In this air fight Naval Lieut. Banfield and Lieut. Bronowski distinguished themselves.

"On Sunday evening one of our naval squadrons successfully bombed an enemy position near Doberdo, and returned safely, in spite of being heavily bombarded."

Vienna, December 6th.

"On Dec. 3rd a Royal and Imperial aeroplane squadron dropped bombs on the barracks of Ciungi. Several hits were obtained without any damage being done to the squadron."

Bulgarian. *Sofia, December 7th.*

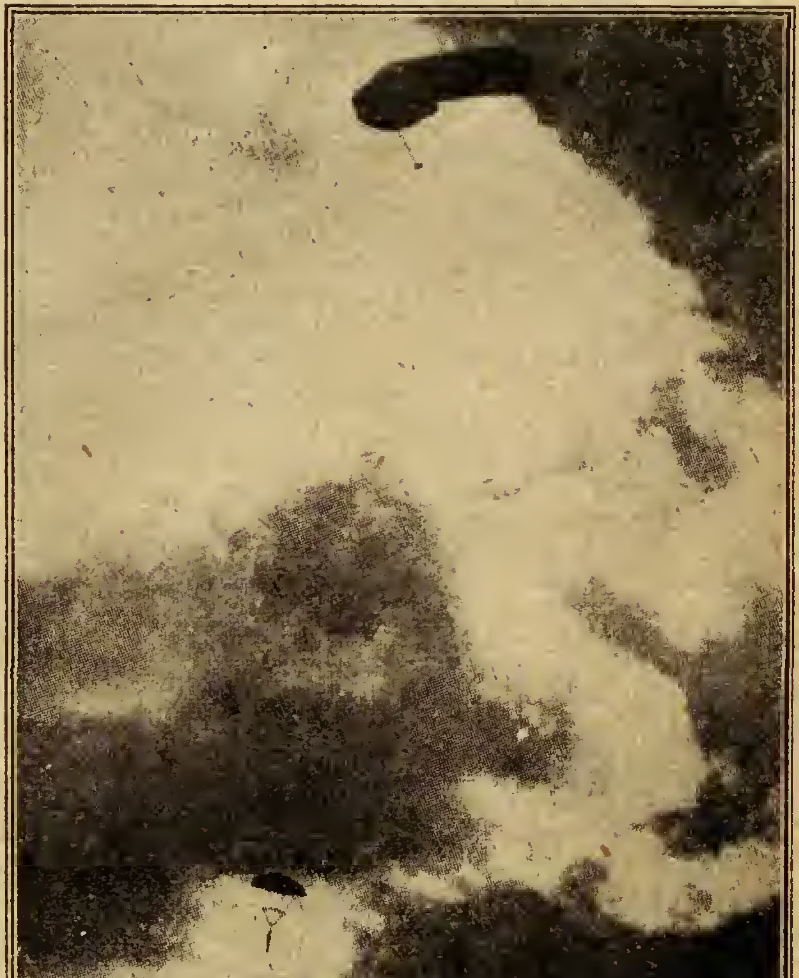
"In this region (northern shore of Lake Tahinos) our guns brought down an enemy aeroplane, which was burnt."

Turkish. *Constantinople, December 5th.*

"A British biplane was brought down by our fire on the Syrian coast, near Remble. The pilot and observer were taken prisoners."

Constantinople, December 11th.

"*Tigris front.*—Our aeroplanes successfully dropped bombs on an enemy airshed, and forced two aeroplanes to descend."



DOWN!—A remarkable photograph of an observer leaving his kite balloon in a parachute. (*By courtesy of our Dutch contemporary "Avia."*)

SIDE-WINDS.

Another Cellon extension—this time in the telephone department. A new number—London Wall, 3622—has been installed in addition to the familiar London Wall, 5359. Clients are, however, asked to continue to use the old number as far as possible, so as to leave the other free for outgoing calls.

- - -

By the way, the unique collection of pictures, photographs and curios which Mr. A. J. Wallace Barr has in his offices at Broad Street House, New Broad Street, is steadily growing—in fact, there is a pretty big nucleus of what promises to grow into a veritable aero museum.

- - -

The National Aircraft Manufacturing Co., of Printing House Yard, 15a, Hackney Road, N.E., has not been long in finding extensions necessary, and has now taken over two more large workshops for woodwork. The firm are in the happy position of being able to obtain all the labour necessary and under the able guidance of one of the oldest hands in aviation, is forging ahead. A new department has now been installed and equipped for turning out all metal fittings for aircraft.

- - -

Simms Motor Units, Ltd., are now installed in their new headquarters, Percy Buildings, Gresse Street, Rathbone Place, W. Their telephone call is now Museum 2469 and 2461.

- - -

Those who are on the lookout for timber, should specially note that Messrs. Chas. Boss & Co. (Liverpool) have now on the way to Liverpool about 100 stds. Prime Silver Spruce, all rift sawn.

- - -

Realising that the bulk of Barimar scientific welding work is either directly or indirectly for the naval or military services or for public undertakings, all the company's expert workmen, we learn, have decided to restrict the Christmas holiday arrangements, and confine them to Monday and Tuesday (Christmas Day and Boxing Day). Having regard to the extreme pressure under which Barimar, Ltd., have been operating at 10, Poland Street, ever since the inception of the war, and to the men's ready compliance with official requests to cut out summer holidays, it would not have been unreasonable if they had asked for the extension of two days provided for in certain cases by the Ministry of Munitions. There is, however, no sign of relaxation or diminution of the demands for urgency in the treatment of fractured machinery used for National purposes, and Barimar workers do not intend to allow the country's interests to suffer for purely personal reasons.

- - -

Those who are considering the use of obturators or flexible piston rings, either in rotary engines or engines with fixed cylinders will be interested to hear that Engineering and Arc Lamps, Ltd., of Sphere Works, St. Albans, are introducing a new form of obturator. It is stated that a set of these obturators taken from stock, when tested in an air-cooled engine of 110 h.p., showed a life of 63 hours, without any loss of power and very little wear. The engine was first run for 47 hours, and then, after cleaning, for a further 16 hours.

- - -

On the passing of Mr. Pemberton Billing's interests in the company of Pemberton Billing, Ltd., which he founded, to the remaining directors by purchase, the name of the company has now been changed to "The Supermarine Aviation Works, Ltd." An excellent title, and one which secures to them the very happily coined word "Supermarine," also a brain-wave of "P.B." The company will continue as heretofore under the personal management of Mr. H. Scott-Paine. The address and works remain as before at Southampton.

- - -

The problem of finding Christmas presents for Service pilots and other aviators is not a difficult one if a visit is made to Messrs. Robinson and Cleaver's showroom at 156-158, Regent Street. The success of their special aviation department is sufficient proof that both price and quality are right, and the firm have on view a fine range of articles and equipment which form suitable and practical gifts at this season.

- - -

Attention may also be drawn to the fact that the Annual Christmas Bazaar at Gamage's in Holborn is open, and offers a unique opportunity for obtaining Christmas gifts for young and old. In their aviation department there is no lack of good things, any of which would be welcomed and appreciated by officers and men in either of the flying services, while for the young idea, with a hankering for aviation, there are toys in plenty—model aeroplanes, kites, engines, &c.—and at prices to suit all pockets.

- - -

A reminder may also be given that the G.A.C. series of wristlet altimeters, compasses, &c., form Christmas presents which never fail to be appreciated by the recipient, and they can be obtained at 30, Regent Street, Piccadilly Circus, S.W., in a variety of styles to suit all requirements.

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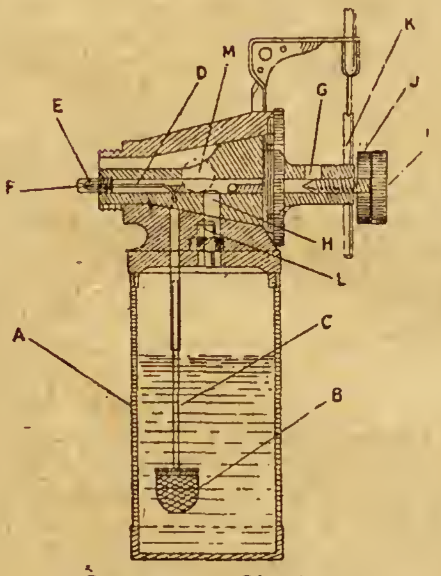
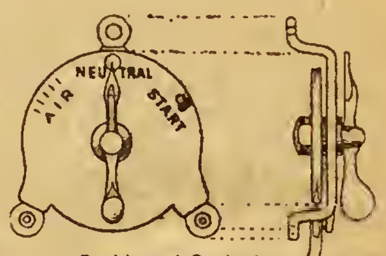
TO FACILITATE STARTING UP.

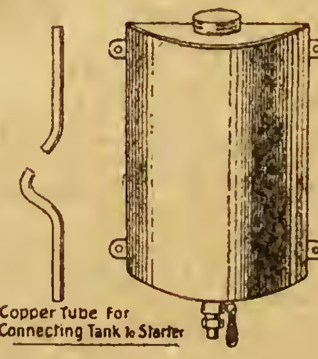
One of the chief troubles in connection with the internal combustion engine is the difficulty often experienced in starting up, especially when a petrol substitute or mixture is being used. Many inventive minds have tackled the problem, and quite a number of devices have been placed on the market from time to time. One little fitting for the purpose, which is now being introduced by Messrs. Gunspray, Ltd., 39, St. James's Street, S.W., is the "Gunspray" shown in the accompanying drawings. From the small service tank shown in Fig. 3 the petrol runs down into the reservoir *A* of the starter, which is seen in section in Fig. 1. On the engine being turned half a revolution, the suction at *F* draws the petrol up through the gauze strainer *B* and pipes *C* and *D* to the mixing chamber *E*, where it meets the air admitted at *G*. The amount of air which is allowed to enter is regulated by the screw valve I, and when the correct adjustment is reached, it may be locked by the milled nut J. The device is controlled by the pointer shown in Fig. 2, which is fixed on the dashboard and connected by a Bowden cable to the wheel *K*. With the pointer placed on "Start," the "Gunspray" delivers a correct explosive mixture, and as soon as the engine is warmed up, the usual fuel supply should be turned on, and the pointer turned to neutral, thus cutting off the starting mixture.



Gunspray Starter and Fuel Economiser
FIG. I.



Dashboard Control.
FIG. II.



Copper Tube For Connecting Tank to Starter

Petrol Tank for Dashboard
FIG. III.

Apart from its use for starting purposes, the "Gunspray" is also claimed to be a fuel economiser, as by gradually moving the pointer to "Air," a port is opened which admits extra air to suit the requirements of the engine.

Another advantage claimed for the "Gunspray" for use on cars is that, in the event of carburettor trouble, it would be quite possible to get home with the aid of the "Gunspray," a consideration which those who have ever been stranded by elusive carburettor trouble will appreciate.

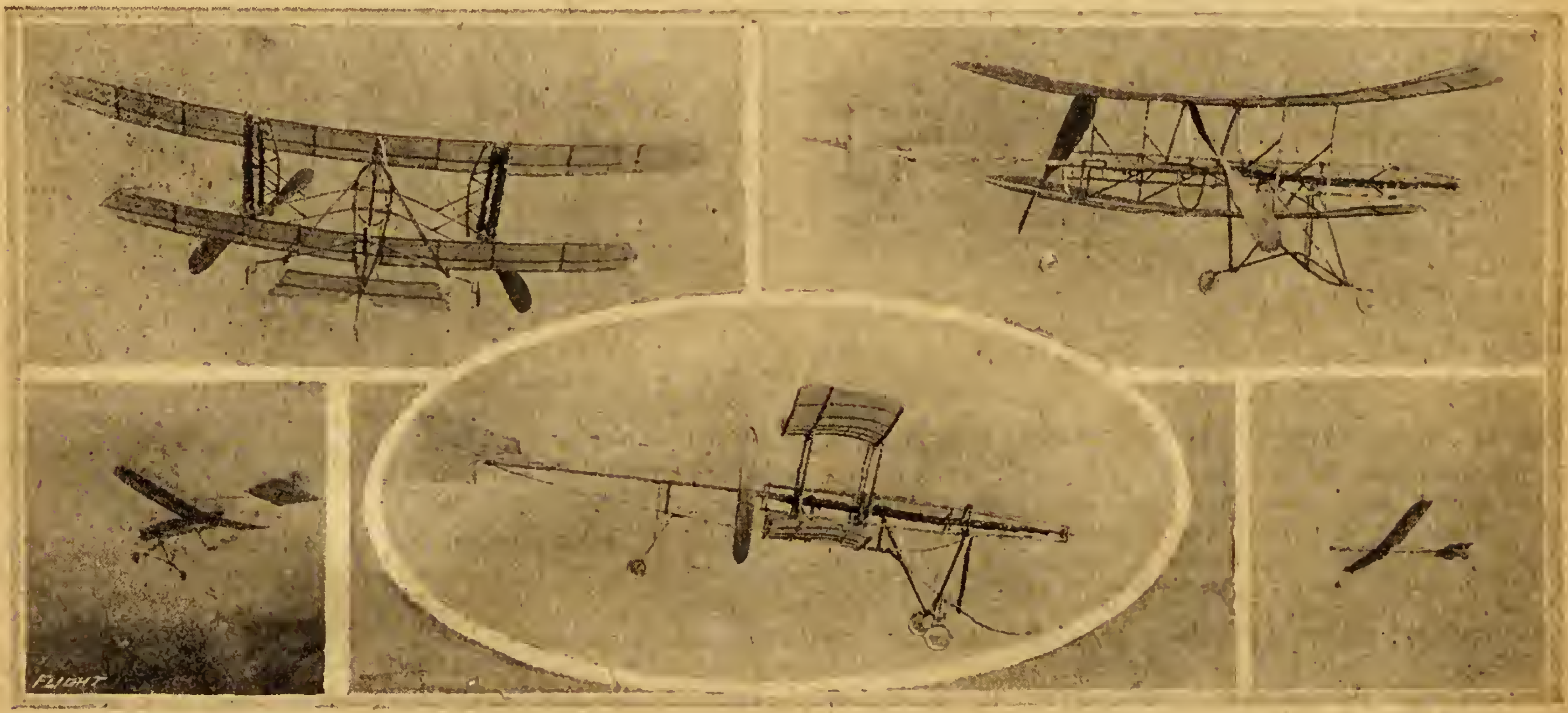
The fitting of the "Gunspray" is quite a simple matter, and can be effected generally in about 20 minutes, while its addition to the equipment means very little extra weight, as it is said to weigh less than 20 ozs. The cost, complete, is £5 5s.

Models

"Pusher" and other Models.

Mr. J. W. Reid having joined the Royal Fusiliers, the whole of the senior members of the South-Western Aero Club are now with the Forces, and so the club is suspended for the duration of the war. In sending along some time ago this item of news, Mr. Reid also enclosed a few photos of some of his latest machines, and no doubt many of our readers will be interested in the "pusher" machines, especially the biplane with its twin propellers. Writing with regard to these, Mr. Reid says :—

"Of the two photos. in flight one shows my tractor monoplane which is about 44 ins. span, 40 ins. long, with a 12-in. propeller. Mr. Howse made one slightly larger, which would go for about 43 secs. against my 37-38 secs.



"In October, 1915, I started experiments with single pusher machines after the style of the Mersey monoplane of a few years ago. Of the third machine I enclose one photo. in flight. It made its first appearance in early December, and showed very great steadiness, but was rather under-powered. After tuning up it flew well and consistently with remarkable steadiness in quite high winds, which my tractor could not tackle. Its two predecessors both had a similar fault, that of nose diving and stalling unaccountably. I eventually traced that to side area, and experiments in that direction helped me considerably in designing the last model of that type, and later my twin pusher biplane. The principal measurements of my single pusher mono. were : Span, 43 ins. ; length overall, 40 ins. ; diameter of propeller, 12 ins. ; length of motor, 21 ins., giving a duration of 20–25 secs., the propeller being driven by 10 strands of ¼-in. strip rubber geared in the *middle*, which is situated at the front end of the body.

"On January 1st I commenced work on my twin pusher biplane.

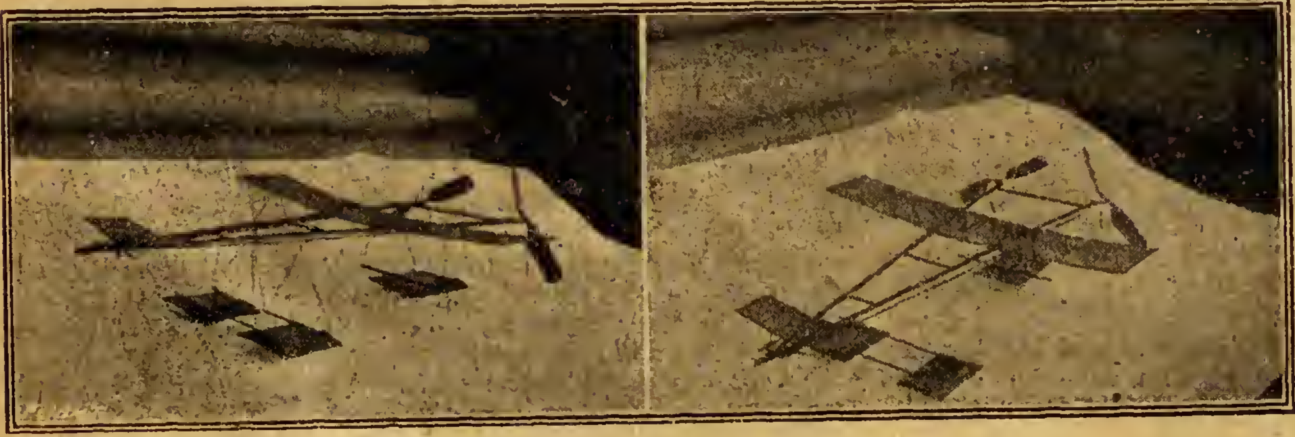
"It was finished at the end of February, and during March was out for first trials. Before I enlisted I was only able to test it once more, when it showed up quite well considering that it was rather under-powered. The chief measurements are : Span, top plane, 49½ ins. ; bottom plane, 40 ins. ; chord, 7 ins. ; propellers, diam., 12 ins. (These were badly made, and only gave a combined thrust of 4 ozs.) The motors were similar to that on the pusher monoplane, and were 20 ins. long and detachable. Total weight of model, "all on," 18 ozs., and area about 430 sq. ins.

"Its tests were never completed, my enlistment interrupting them, but I am quite convinced that another month's work and that model would easily have been the steadiest and most consistent flyer I have made. I expected to get 20 to 25 secs. duration (25 secs. were actually obtained), which I know is very little, but quite sufficient to show up the worth of the model."

A Waterplane Model.

Mr. G. Allen, a New Southgate reader, sends the following details of an interesting waterplane model :—

"Enclosed please find two photos. of a model hydro-aeroplane I have recently constructed, and below give a brief description.



A couple of snap-shots of the waterplane model described above by Mr. G. Allen.

" Frame, 33 ins. in length, ¼ in. spruce ; main plane, 28 ins. by 5 ins. chord, covered with varnished silk ; elevator, 9¾ ins. by 3 ins. chord ; front floats, 6½ ins. by 2½ ins. by 1 in. deep, situated three inches in front of centre of gravity, varnished silk stretched over white wood frame ; back float, 8 ins. by 3 ins. by 1 in. ; distance between front floats, 6 ins. ; propellers 9½ ins. in diameter ; power, 12 strands $\frac{3}{16}$ in. flat rubber.

" The model when wound up to 500 turns leaves the water in 12 ft. and the average duration is 15-20 secs., but I think it will be improved considerably when larger front floats are fitted as the model seems under-floated. The floats are attached to the frame (usual A type) by means of 18 gauge steel wire. The propellers are bent wood (birch), and varnished with three coats of copal varnish. A slight accident to front floats necessitated a rest in the hospital, and it is now undergoing one or two alterations. Thanking you for the assistance I have received from your excellent paper."

Bombing Raids in Belgium.

THREE British machines did extensive damage by bombing railway junctions near Brussels, on December 6th, according to the *Maastricht Nouvelles*. German anti-aircraft batteries attacked them without result.

The *Daily Telegraph* correspondent, writing on December 11th, says : " Yesterday and to-day the Allies' airmen were very active in Belgium. This morning a raid on Zeebrugge was carried out, about a dozen aeroplanes, so far as could be noted, taking part. On Sunday scores of the Allies' machines were flying about behind the German lines. An enormous number of bombs was dropped on various points of military importance. The German communications were greatly harassed, and so persistent and daring were the airmen that in some districts the railway troop traffic was stopped. Certain of the flyers were over Brussels, and others are said to have reached as far as Louvain."

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

STRAIGHTS with Instructor, last week : Mr. Scudamore. Circuits with Instructor : Messrs. Coltman, Fielding, Nightingale, Pearman, Lord and Shaw. Circuits alone : Mr. Flynn.

Brevets during week : Messrs. Balden, Green, Robertson, Styles and Sutherland.

Instructors : Messrs. Pashley, Biard, Fitzsimons and Meering.

Bournemouth School.

STRAIGHTS alone, last week : Messrs. Ross, Fisher and Green. Half-Circuits alone : Messrs. Peat and Vermorel. Circuits and eights : Messrs. Allen and Little.

Instructors : Messrs. E. Brynildsen and H. Smith.

Certificates taken during the week by Messrs. Hall, Allen and Little.

COMPANY MATTERS.

Frederick Sage and Co., Ltd.

THE report of Frederick Sage and Co., Ltd., states that, it having been found impossible to complete the accounts owing to the liability for special taxation not having been agreed, the meeting called for 19th inst. will be of a purely formal character, and will be adjourned until a date at which the balance-sheet and profit and loss account can be presented. The directors have resolved to pay on the 19th inst. a dividend of 6 per cent. on the preference shares and of 6 per cent. on the ordinary shares on account of the profits for the year ended 30th September last.

Palmer Tyre, Ltd.

THE report of the Palmer Tyre, Ltd., for the year ended September 30th, shows a profit of £10,687, to which has to be added £563 brought forward. The directors, for the third consecutive year, are able to recommend a dividend, free of tax, at the rate of 12½ per cent. per annum, and that £2,000 be carried to reserve, leaving to carry forward (subject to payment of directors' fees) £1,751.

" Shell."

THE directors of the " Shell " Transport and Trading Co. announce that they will pay an interim dividend on the ordinary shares on account of the year 1916 of 2s. per share (10 per cent.), free of tax, on January 5th. This is the same as paid last year.

Joseph Owen and Sons, Ltd.

THE report of Joseph Owen and Sons, Ltd., states that the profits for the year to June 30th were £59,137, and £1,378 was brought forward. A dividend of 6¾ per cent. is proposed on the ordinary shares, placing £1,188 to a special reserve, £2,000 to the reserve for debenture redemption and £6,500 to the reserve to provide for special war taxation, and carrying forward, subject to manager's commissions, &c., £2,489.

IMPORTS AND EXPORTS, 1915-1916.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912 ; for 1912 and 1913, see "FLIGHT" for January 17th, 1914 ; for 1914, see "FLIGHT" for January 15th, 1915 ; and for 1915, see "FLIGHT" for January 13th, 1916 :—

	Imports.		Exports.		Re-Exportation.	
	1915.	1916.	1915.	1916.	1915.	1916.
	£	£	£	£	£	£
January ...	20,382	1,509	435	6,399	13,706	—
February	380	6,444	138	30,693	18,823	—
March ...	280	3,388	7,218	17,872	5,090	7
April ...	2,189	3,383	23,986	22,608	275	3,783
May ...	178	1,986	12,530	26,165	8,250	300
June ...	5,469	4,986	3,730	59,287	2,400	—
July ...	1,240	2,072	13,372	12,932	—	—
August ...	664	2,583	36,276	13,555	247	420
September	536	1,076	4,908	36,048	—	—
October ...	1,344	952	17,702	9,289	—	8
November	1,859	7,406	21,979	12,858	—	—
	34,521	35,785	142,274	238,706	48,791	4,518

PUBLICATION RECEIVED.

The Weather Map. An Introduction to Modern Meteorology. By Sir Napier Shaw, F.R.S. London : The Meteorological Office, South Kensington. Price 4*d.*

Aeronautical Patents Published.

Applied for in 1915.

Published December 14th, 1916.

16,189. J. R. K. LAW. Fire control devices for guns mounted on aircraft.

16,446. BLACKBURN AEROPLANE AND MOTOR CO. AND R. BLACKBURN. Machines for marking numbers, &c. on machine parts, &c.

Applied for in 1916.

The numbers in brackets are those under which the specifications are printed and abridged, &c.

Published December 14th, 1916.

584. C. H. BROCKELBANK. Apparatus for safe night-landing of aeroplanes. (102,164.)

1,179. SOC. ANON. SPAD POUR L'AVIATION ET SES DERIVES. Strutting and staying of aerial machines. (100,632.)

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12 „ „ ..	6	6	12 „ „ ..	11	0

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TO OUR READERS.

The Supply of "FLIGHT." Important Notice.

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As the demand for "FLIGHT" is so great each week, it is of the utmost importance that readers should place their orders *firmly* for copies of "FLIGHT" at the bookstalls, their newsagents, or direct from the publishers, at 44, St. Martin's Lane, W.C., if they wish to secure a copy every week and avoid disappointment. The stringent Government restrictions in regard to the supply of printing paper necessitates this precaution in order that only actual numbers required are printed, and all wastage by unsold copies may thereby be reduced to a minimum, if not eliminated.

THE PUBLISHERS.

EDITORIAL COMMENT.

Peace or War?

THE topic of the hour, to the exclusion of all others, is the German proposal that peace terms should be discussed between the two groups of belligerents. We do not know at this moment upon what terms Germany is prepared to discuss peace, but it may be predicated with perfect safety that those terms are not likely to come within even measurable distance of even affording a basis for discussion as between the Allied and the Central Powers. It is perfectly obvious from the tone of her Press and from the utterances of her statesmen that Germany is only prepared to agree to a peace that will leave her in the position of a conquering nation. How much of the pose is bluff and how much honest—if one can apply the term to Germany—conviction we know not, nor does it greatly matter for the time being. The point is that that is the attitude taken up, and in all fairness it must be conceded that from the point of view of actual success in the field Germany has a good deal of justification for that attitude. When we regard the map of Europe it would be the merest stupidity to argue that the Germans have not succeeded in their aims of military conquest to an extent which even they, in all probability, never anticipated when they plunged Europe into war. They have practically the whole of Belgium, with 60 per cent. of industrial France, Poland, Serbia, Montenegro, nearly half Roumania, and a substantial slice of Russia wherewith to bargain. On the other side, she has a corner of East Africa as the sole remaining vestige of her former vast Colonial possessions and the sea blockade is undoubtedly imposing a very severe strain upon her internal resources. Unfortunately, these do not constitute a balancing factor—one which with any show of justification we can use to obtain a peace that could be called a drawn game, even if a draw were possible to be regarded as satisfactory.

We doubt very much if there could be found in the whole of the Allied nations even a substantial minority in favour of a peace on such a basis. Certain it is that such a minority does not exist in Great Britain or in any of her Dominions. Of course, it would be possible to find a few, a very few, who would be content with almost any terms so long as peace could be achieved, but they do not constitute even a "substantial minority."

What is behind the German offer? Is it sincere, or is it merely a proposal intended to be refused with the object of impressing the neutrals and throwing the onus of continuing the war upon the Allies? Is it what has been described as "a clumsy trap" intended to sow discord among the Allied nations? We believe it is meant in all sincerity. Germany wants peace, and feels that she will never be in a better position to get it on her own terms than she is now. She is feeling the economic pressure acutely. While her people are perhaps not actually starving, there is undoubtedly a very serious shortage of food, which is becoming more and more pronounced almost every day. Her credit is exhausted because of the almost total cessation of her international trade. Her shipping industries are bankrupt, and her ships cannot show themselves on the seas. The people are sick of the war to a point which has brought her face to face with the prospect of serious internal trouble. There is thus every reason why Germany should seek for a peace of her own making before the conditions become worse. That is why she has announced that peace is to be had for the asking.

What is to be the reply of the Allied nations? Officially, there has been no reply up to now. Unofficially, the people of the nations arrayed against the German menace have spoken with no uncertain voice. There is to be no German-made peace—there is only one peace possible, and that is the one dictated by a victorious Entente. There is an alternative, which is exceedingly well put by Lord Wrenbury in a letter to *The Times*, in which he says:—

"Let the answer be this: If you (the German peoples) want peace before this fight is fought to a finish, evacuate the countries which you have overrun and oppressed. Let the German peoples themselves, and not their present rulers, then approach us, and we will listen. Until you thus approach us we have nothing to say to you: except that we hope and believe that the day is coming when right shall have conquered might: when courage shall have crushed arrogance: when civilisation shall have strangled savagery, and when we shall have and use the power to dictate terms of indemnity, reparation, and punishment for the greatest crime the world has ever known.

"What is the use of discussing terms with those who pledge their word only to break it: who regard treaties as only a disguise to conceal other political aims? Who would agree, for instance, to limitation of armaments with those who would forthwith surreptitiously increase their own offensive power in reliance on the other contracting parties reducing theirs?"

That is the sane, the only possible view to be taken of the situation, and one which during many past months has been set forth in "Flight." That the German people will adopt it at this juncture we have no reason to hope or believe. That being so, there is but one conclusion to be reached: that the war must be prosecuted to its bitter end and until the whole of the task to which we have set ourselves has been accomplished. That it can be accomplished we have the fullest confidence. Germany is at her zenith, while the Allies are only now reaching the point at which their full resources can be employed. Germany knows this as well as we do, and that is the governing reason of her willingness to discuss terms for ending the war. But we cannot, we dare not, listen to the voice of the peacemonger. No, this war was none of our seeking, but now we are committed we cannot stultify all our past history and traditions by leaving unfinished the work to which we have set ourselves. Rather must we strain every nerve, every resource, for the task that is before us, a task which we can pursue with renewed hope and confidence born of the confession of German weakness displayed in this effort for peace. For it is a confession of weakness, no matter how the German Press and her public men may try to gloss it over by tall talk. We know enough of the internal condition of Germany to be very certain that she would welcome peace as ardently as she welcomed war in August of 1914. Then, she had war on *her* terms. In December of 1916 our reply must be that we only want peace on *our* terms. We know exactly what this means. We have been told by the German Press that if we reject the overtures, it must be a fight to a finish, in which either Germany or the British Empire must disappear from the roll of nations. The challenge has no terrors—we can accept it with confidence in whatever the future may bring forth. Better that the British Empire should disappear than that it should live a dishonoured existence under a German hegemony.

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Air Supremacy after the War.

From time to time in the columns of "Flight" we have urged that the problem of maintaining our aerial supremacy after the war is one of paramount interest, and one that for many reasons should receive urgent attention at the hands of those who are identified in any shape or form with the great movement of aviation. We welcome, therefore, the excellent expressions of opinion contained in an article by the motoring correspondent of the *Daily Telegraph*, in which the future of the aviation industry after the war is discussed at some length. These opinions coincide so well with those we have frequently expressed, and which we believe to be thoroughly sound, that we feel we need make no apology to our readers for quoting from them. As he points out:—

"In this country the production of aeroplane engines, parts, chassis, and the complete machine, has reached a very high state of efficiency. But we must not stop here—without continued effort no improvements will be made. No orders after the war will mean no works, and the commercial aspect is usually the only point of view recognised. It is practically certain that it will be impossible for the Government to place orders on the present generous scale, but other orders will have to be found to keep the works alive and enable them to improve the aeroplane, both as a fighting weapon and as a commercial concern.

"In the early days of motor cars a few wealthy amateur sportsmen kept the industry going until it became a sound commercial proposition. The aeroplane has developed on somewhat similar lines, only much quicker owing to the war. It has reached, in fact, such a pitch of perfection that the few rich men and women who may keep an aeroplane to go to the Riviera, as they keep a car to go shopping, will be insufficient to encourage the production of, say, 1,000 complete machines a week, which should be the minimum output. No doubt many of the countries, now at peace with the world, will give some of the British aeroplane manufacturers orders after the war, but it is not wise 'to count such chickens before they are hatched.' It behoves, therefore, those in this country who believe in aerial supremacy to face the position of affairs and endeavour to arrange that the good work should go on. It is well known that machines can be built to carry from two tons to eight tons load, and, perhaps, even more, so the commercial world may consider them as goods carriers or passenger transporters. Moreover, the flight across the Atlantic from England to America is not beyond our powers; indeed, there is every probability of that event taking place in our time. But to ensure it proper encouragement must be given to the aeroplane designer and manufacturer.

"One might specify one hundred different schemes for the use of aeroplanes besides those in which they are at present engaged. No doubt each project would find some critic to belittle it, but for the national welfare it is necessary to inquire into and foster all plans. At present our united aims are to win the war, but it is not wise to neglect the future, and the prospects of the aeroplane industry will be poor indeed when peace arrives, unless steps are taken before then to ensure its continuance on lines worthy of its vast resources in Great Britain and the Empire beyond the seas.

There is really no need for us to elaborate the points raised. We agree absolutely that if the industry is to be preserved and maintained both the State and the individual must combine in a common effort to keep this country at the head of the aerial Powers. It is not a matter of bolstering up an industry for the profit of the individuals concerned in it—it is a question of national safety that is involved. We have been caught napping once, and our motto must be: "Never again!"

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The Old Clique. In common with every right-thinking citizen, we had hoped and believed that all questions of "Party" had been shelved, if not permanently, at least for the duration of the war. We have a Government now in whom we feel confidence, and we have faith that if they are allowed to carry out their own policy in their own way they will make good. But what of the influences outside the Government? We confess we do not like the tone of some of the speeches. Mr. McKenna's repeated references, for example, to "the leader of the Liberal Party" do not ring true. The same is to be said of Mr. Runciman's recent speech, which was that of the disappointed politician, and we are glad to note that on Tuesday Mr. Asquith very emphatically washed his hands of Mr. McKenna's untimely attempt to drag him into such indecent political jobbery. Already there is talk of a "plot" against Mr. Lloyd George, engineered by members of the late Administration. We can scarcely credit the existence of a cabal against the new Cabinet, though we know the professional politician to be capable of anything in his quest of the sweets of office. But assuming that anything of the kind does in fact exist, those who are responsible are taking upon themselves a heavy and a dangerous responsibility. They will find that the country is in no mood to tolerate the machinations of those who prefer the interests of Party to those of the State. The nation is bent on winning the war, and it will have scant mercy for any who attempt to stand in the way. It might have been thought that the old political clique would have by this time discovered that the nation has no use for them and that their best course would be to retire into the obscurity to which they belong. If they have not assimilated that lesson, and if they still labour under the delusion that the nation will tolerate any interference with the conduct of its affairs, we warn them that they are likely to make their last case worse than the first. We have had enough of them, and they must be singularly dense of understanding if they do not realise the fact.

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The New Cabinet and Aerial Policy. Already the new Cabinet seems to be making itself felt in matters affecting aerial policy. Speaking in the House on Monday last, Sir Geo. Cave, the new Home Secretary, said it was proposed to create the office of Parliamentary Secretary to the Air Board or alternatively to any authority or Board constituted in connection with the supply of aircraft during the present war. He was authorised to state that owing to pressure of work involved in the formation of the Government, it had not been possible to decide all matters connected with the Air Board. The work of the President was still being carried on by Lord Curzon, and the Government were satisfied that the services were not suffering in the meantime. They were glad to say that the two fighting departments, the War Office and the Admiralty, had arranged to utilise to the full the services of the Air Board.

This is indeed good reading. Even though, in the words of the Home Secretary, it has not been possible to decide everything in a week, the mere fact that the differences between the two fighting services, which have stood in the way of efficient work, have been apparently composed within so short a space of time is eloquent of better things to come. Then, the proposed appointment of a Parliamentary Secretary must mean, if it means anything, that we are to have an Air Board with authority to *do* things and not merely to discuss them in a detached and academic fashion, which is what we have been advocating for many months past in season and out of season.

It is very evident that at last we have an Administration which does realise the paramount necessity of bending every endeavour to the maintenance of our hardly won supremacy of the air. Its first announcement on the subject, slight as it may be in fact, is a sufficient indication that for the first time since the beginning of the war the Air Service is regarded with the seriousness it deserves. From every point of view this is a matter for satisfaction to every one, and in particular to those who, like ourselves, have constantly urged upon the Government that it is a matter of the gravest national import that the service should be put upon a proper footing and its affairs removed from the sphere of inter-departmental jealousies. The new Government is much to be congratulated upon the work already accomplished and on the promise of the future.

FINAL REPORT OF THE COMMITTEE ON THE ADMINISTRATION AND COMMAND OF THE R.F.C.

THIS report, signed by the Chairman, Mr. Justice Bailhache and the other members of the Committee, was issued on Wednesday, and consists of 25 foolscap pages of printed matter. After dealing in detail with the charges, &c., their recommendations and final remarks are as follows :—

I.—Our first recommendation, and that to which we attach greatest importance, is that the equipment of the Royal Flying Corps should be entirely separated from the executive command. General Henderson's position as Commander of the Royal Flying Corps, responsible for it as a fighting arm and at the same time responsible as Director-General of Military Aeronautics for its equipment, is an impossible position for any man to fill now that the Royal Flying Corps has grown to its present dimensions, and especially in view of its probable further growth. There seems no reason why this change should not be made at once. There are officers on the Directorate of Military Aeronautics who have now sufficient experience to take over equipment and deal with it independently.

Whether there should some day be a united air service combining the Royal Flying Corps and the Royal Naval Air Service we are not in a position to say. However that may be, we see no reason against having one Equipment Department charged with the equipment of both the Army and Navy Flying Services. There would no doubt be inter-Service jealousy to contend with, but that should not be allowed to stop a much needed reform.

There could hardly be a stronger illustration of the need for a united equipment service than the fact that, at the beginning of the war, the manufacturing resources open to the two Services were divided between them without any possible knowledge of how the division would work out in practice, a division which has in fact given rise to many difficulties.

We have seen how separate Equipment Departments for each Service led to friction in France, and how the friction ceased when one officer was sent there for both Services.

A joint Equipment Department would, in our view, tend to abolish competition and friction between the Services and make for increased efficiency.

II.—We think the continued existence of the R.A.F. is essential. It should not, in our opinion, become a manufacturing establishment, but should confine its activities, as at present, to the five subject stated in our Report, namely :—

(1) Trial and experiment. (2) Research. (3) Preparation of drawings. (4) Repairs. (5) Manufacture of spares.

The R.A.F. would need to be controlled by the Equipment Department of Military Aeronautics, but if this department was entirely divorced from the Royal Flying Corps, much of the Trade jealousy of the R.A.F. would, we hope, disappear.

We would have aeroplanes and engines, whether of private or of R.A.F. design, tested by the Royal Flying Corps at, say, the Central Flying School quite independently of the Equipment Department in any of its branches. It would probably be necessary for this purpose to add to the staff at Upavon mechanical engineers of high standing.

III.—We recommend that, during the war, and until our ideal of interchangeable observers and pilots is reached, observers should receive promotion without having to become pilots, and that a corps of observers be formed with a regular establishment graded for promotion among themselves.

IV.—There are one or two minor recommendations which obviously arise out of our Report, such as the tightening of discipline in the upkeep of school machines. These we do not think it necessary to repeat.

We have finished the duty we were asked to perform. The task of fault-finding, always unpleasant, became more and more distasteful to us as we proceeded with our inquiries. When we look back to the Royal Flying Corps at the outbreak of war setting out with its 100 or so pilots, its 66 aeroplanes for the Front, and with its 20 serviceable ones at home for training, when we remember that none of its engines were of British design, and that it was dependent upon the goodwill of our Allies, the French, for much of its material, and when we see it now increased out of all recognition in numbers and efficiency of its aeroplanes, with their vastly improved engines, its ability to rely upon British manufacturers to supply its needs, its training schools, its aerodromes, its equipment, its pilots and observers, its army of mechanics, it seems as though the Royal Flying Corps is a new creation.

Our admiration is increased when we remember that all the work necessary to bring it into its present state of efficiency has been done while bearing the heavy burdens of rendering such services as the Army required of it in the Field and on the fronts.

A microscopic examination has disclosed some mistakes, as we think. How could it be otherwise ? General Henderson has told us that the responsibility is his for such shortcomings as there are. We ascribe them to the difficult position in which he was placed.

The gratitude and thanks which are his due for a great work devotedly undertaken and well done he will, we know, be glad to share with the officers and men who have served under him, whether as Commander of the Royal Flying Corps or as Director-General of Military Aeronautics.

An Air Ministry at Last.

IN the House of Commons on Tuesday, the Home Secretary, Sir George Cave, moved to insert in the New Ministries and Secretaries Bill a clause setting up an Air Board, to consist of a President and other members, for the purpose of organising and maintaining the supply of aircraft in the national interest in connection with the present war. The President will be deemed to be a Minister and the Air Board a Ministry.

The clause was inserted in the Bill, as also was the following clause:—The Air Board shall, in relation to aircraft, have such powers and duties of any Government Department or authority, whether conferred by statute or otherwise, as His Majesty may, by Order in Council, transfer to the Board, or authorise the Board to exercise or perform concurrently with or in consultation with the Government Department or authority concerned.

D.S.O. for Zepp. Strafer.

HIS MAJESTY THE KING has been graciously pleased to appoint Temporary Second Lieut. Ian Vernon Pyott, R.F.C., a Companion of the Distinguished Service Order, in recognition of conspicuous gallantry and devotion to duty in connection with the destruction of an enemy airship.

Another Military Medal for R.F.C.

IN the list of men upon whom His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field, announced in the *London Gazette* on December 14th, the following appeared :—

G. 26969 2nd Class Air-Mech. T. ROBINSON, R.F.C., late R. Innis. Fus.

Recruits Wanted for the Anti-Aircraft Corps.

AN opportunity occurs for men over military age who wish to do their bit at home, as there are vacancies for such men to relieve men fit for general service who are now going abroad. The headquarters are at 4, Whitehall Gardens, from where full particulars can be obtained.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE, *it is not repeated in this column.*

Royal Naval Air Service. *Admiralty, December 12th.*

G. H. Murphy granted a temp. commission as Lieut., R.N.V.R., seniority November 11th.

R. F. P. Abbott, W. C. Johnston, N. I. Larter, and P. W. Jenckes entered as Prob. Flight Officers for temp. service, date November 7th.

Admiralty, December 13th.

Paymaster (Flight Commdr.) H. A. Michell, promoted to the rank of Staff Paymaster, with seniority December 13th.

Admiralty, December 15th.

The following entered as Prob. Flight Officers for temp. service, to date as stated:—E. T. Langdon and J. F. S. Vaughan, Nov. 3rd; R. T. Eyre and F. S. Strathy, Nov. 5th; C. Becker, H. C. Gooch, W. A. N. Davern, J. H. Forman, C. C. Inderwick, J. N. McAllister, S. F. Everson, and D. F. Murray, Nov. 17th; L. D. Bawlf, Dec. 14th.

Admiralty, December 18th.

W. P. Rogers granted a temp. commission as Lieut., R.N.V.R., and appointed to "President," for R.N.A.S., dated Dec. 16th.

The undermentioned granted temp. commissions as Lieuts, R.N.V.R., and appointed to "President," additional, for R.N.A.S., all date Dec. 16th: G. J. Pickthall, G. G. Shepherd, A. Gordon and B. A. Castle.

Royal Flying Corps (Military Wing).

London Gazette, December 12th.

Squadron Commander.—Major I. A. E. Edwards, R.A., from a Flight Comdr. Dec. 1st.

Flight Commanders.—The appointment of Lieut. (Temp. Capt.) C. E. Wardle, S.R., notified in the *Gazette* of Oct. 12th, is antedated to July 1st. The appointment of 2nd Lieut. (Temp. Capt.) L. F. Hursthouse, S.R., notified in the *Gazette* of Oct. 16th, is antedated to July 1st. From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. (on prob.) E. J. L. W. Gilchrist, M.C., 9th Lrs., S.R.; Nov. 27th. Lieut. B. P. G. Beanlands, Hamps. R.; 1st Dec.

Flying Officers.—Nov. 22nd: 2nd Lieut. (Temp. Lieut.) C. H. Davies, R. Highrs., T.F.; Temp. 2nd Lieut. C. R. W. Knight, Gen. List; Lieut. G. B. R. Schon, M.C., S. Staff. R., from Machine Gun Corps, and to remain secd.; 2nd Lieut. (on prob.) F. I. Fleming, S.R.; Temp. 2nd Lieut. F. K. Crosbie-Choppin, Gen. List. 23rd Nov.: Lieut. W. O. P. Winmill, Bedf. R., from a Flying Officer (Observer), with seniority from June 28th; Temp. 2nd Lieut. R. J. Warner, Gen. List; Temp. 2nd Lieut. A. R. Johnston, Gen. List; Temp. 2nd Lieut. J. E. Lewis, Gen. List; Temp. 2nd Lieut. (on prob.) M. E. Woods, Gen. List. Nov. 24th: Temp. 2nd Lieut. C. S. Cravos, Welsh R. and transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) M. C. Farnes, K.R. Rif. C., and to be transfd. to Gen. List; Temp. 2nd Lieut. G. M. Turnbull, Gen. List. Nov. 25th: 2nd Lieut. H. A. Tracey, S. Wales Bord., and to be secd.; Temp. 2nd Lieut. T. S. Edelston, Gen. List. Nov. 26th: 2nd Lieut. F. MacB. Paul, R. War. R., and to be secd.; Lieut. V. I. Hardy, Suff. R., S.R., and to be secd.; 2nd Lieut. C. B. Riddle, Durh. L.I., T.F.; 2nd Lieut. H. A. Cooper, Lond. R., T.F.; 2nd Lieut. (on prob.) R. B. Lovemore, Lond. R., T.F.; 2nd Lieut. (on prob.) J. C. Rimer, S.R.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. G. F. F. Collender, Gen. List; May 24th. Temp. 2nd Lieut. F. Jefcoate, Suff. R., and to be transfd. to Gen. List; Nov. 10th. Temp. 2nd Lieut. A. Wragg, Gen. List; Nov. 21st.

Memoranda.—The undermentioned Warrant Officers from R.F.C., to be 2nd Lieuts. for duty with that Corps. Dec. 7th: Serjt.-Major. F. T. McElwee, Acting Sergt.-Major C. J. Brockbank. 2nd Class Air Mechanic C. Rayner to be Temp. 2nd Lieut. (on prob.) for duty with R.F.C.; Sept. 28th. (Substituted for the notification in the *Gazette* of Oct. 11th.)

Supplementary to Regular Corps.—2nd Lieut. G. D. Rae resigns his commission; 13th Dec.)

London Gazette Supplement, December 13th.

Staff Officer, 3rd Class (graded for pay as a Staff Capt.).—Temp. Capt. G. C. Anne, Yorks. L.I., T.F.; Oct. 8th.

Flying Officers.—Temp. 2nd Lieut. K. K. Muspratt, Gen. List; Nov. 2nd. Temp. 2nd Lieut. A. Fraser, Gen. List; Nov. 8th. Nov. 23rd: Temp. Lieut. C. A. F. Whitley, M.C., R. Suss. R., and to be transfd. to Gen. List; Temp. Lieut. G. F. Westcott, Gen. List, from a Flying Officer (Obs.), with seniority from May 31st; 2nd Lieut. G. W. Board, E. Surr. R., S.R., and to be secd.; Temp. 2nd Lieut. B. G. King, Gen. List. Nov. 24th: Temp. 2nd Lieut. M. G. Cole, Gen. List; 2nd Lieut. D. C. Cunnell, Hamps. R., T.F. Nov. 25th: Temp. 2nd Lieut. T. S. Howe, M.C., Gen. List, from a Flying Officer (Obs.), with seniority from May 30th; Lieut. J. Butler, M.C., R. Ir. Fus., and to be secd.; Temp. 2nd Lieut. H. H. McIntosh, Gen. List; 2nd Lieut. (on prob.) C. Sutton, S.R. 2nd Lieut. (Temp. Capt.) M. B. Knowles, Lond. R., T.F.; Nov. 26th. Nov. 27th: Temp. 2nd Lieut. H. D. Davis, Gen. List.; Temp. 2nd Lieut. H. S. Robertson, Gen. List; 2nd Lieut. (on prob.) B. H. Godfrey, S.R.; Temp. 2nd Lieut. V. F. Williams, Gen. List. Nov. 28th: 2nd Lieut. (on prob.) A. Coningham, S.R.; Temp. 2nd Lieut. T. A. Cooch, Worc. R., and to be transfd. to Gen List.

Flying Officer (Observer).—Temp. Lieut. W. O. T. Tudor-Hart, M.C., Northd. Fus., and to be transfd. to Gen. List; June 25th.

Adjutant.—Temp. Capt. F. A. Forde, Gen. List, from a Brig. Major, vice Temp. Capt. F. R. Hedges, Gen. List; Oct. 11th.

Park Commander.—Capt. F. Jolly, S.R., from an Equipment Officer, 1st Cl., and to be Temp. Major whilst so empld.; Dec. 1st.

Equipment Officers, 2nd Class.—From the 3rd Class and to be Temp. Lieuts. whilst so empld. Dec. 1st: 2nd Lieut. C. F. J. North, S.R.; 2nd Lieut. H. W. Mills, S.R.

3rd Class.—2nd Lieut. (on prob.) G. Barnett, S.R.; Nov. 7th.

Memoranda.—The undermentioned to be Temp. Capt.: Temp. 2nd Lieut. G. A. Hoghton, for duty with R.F.C.; Oct. 14th. The undermentioned to be Temp. Lieuts. whilst serving with R.F.C. Nov. 1st: 2nd Lieut. R. L. Clegg, Lancs. Fus., S.R.; Temp. 2nd Lieut. J. F. Alcock, Temp. 2nd Lieut. E. R. Cottier, Temp. 2nd Lieut. H. Thrower. The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Petty Officer A. G. D. West, from R.N.V.R., Nov. 8th; Temp. 2nd Lieut. F. W. Byrne, from Res. of Offi., R. Mar., Dec. 14th.

Supplementary to Regular Corps.—2nd Lieut. (on prob.) H. V. Phippen resigns his commission; Dec. 14th. The probationary appointments of the undermentioned 2nd Lieuts. are cancelled, under the provisions of para. 221, Regulations for Officers of the Special Reserve. Dec. 14th: H. Cockroft, W. J. Pike, G. N. B. Baynes.

London Gazette Supplement, December 14th.

Adjutants.—2nd Lieut. (Temp. Lieut.) A. H. Stradling, Gord. Highrs., T.F., and to retain his temp. rank whilst so empld., vice Lieut. R. Whitaker, Rif. Brig.; Nov. 13th. Lieut. R. C. Morgan, Canadian Art.; Nov. 15th.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: B. H. Godfrey, A. Coningham, C. Sutton. The undermentioned to be 2nd Lieuts. (on prob.): A. Glynne; Oct. 6th. D. R. Munro; Nov. 21st. A. W. Chapman; Nov. 27th. E. H. Wilding; Dec. 8th.

London Gazette, December 15th.

Flight Commander.—Capt. C. Cooper, R.W. Surr. R., S.R., from a Flying Officer; Dec. 3rd.

Equipment Officers, 2nd Class.—From the 3rd Class, Nov. 1st: Lieut. H. K Maxwell, S.R. And to be Temp. Lieut. whilst so empld.: 2nd Lieut. H. L. Saunders, S.R.

London Gazette Supplement, December 16th.

Flying Officers (Observers).—Temp. Lieut. C. N. Jones, Notts. and Derby R.; Oct. 31st. Temp. 2nd Lieut. C. Curtis, Middx. R., and to be transfd. to Gen. List; Nov. 5th. Nov. 15th: 2nd Lieut. H. C. Benstead, N. Staff. R., T.F.;

2nd Lieut. (on prob.) F. S. Andrews, S.R. Dec. 1st: Lieut. J. C. Perkins, W. York. R., S.R.; Temp. Lieut. A. P. Wilson, High. L.I., and to be transfd. to Gen. List; 2nd Lieut. R. L. M. Jack, Gord. Highrs., T.F.; Temp. 2nd Lieut. (on prob.) G. W. B. Bradford, Gen. List.

Equipment Officer, 1st Class.—Temp. Lieut. (Temp. Capt.) R. Whiddington, Hamps. Aircraft Parks, T.F., and to retain his temp. higher rank whilst so empld.; Nov. 25th.

3rd Class.—Temp. 2nd Lieut. L. P. Ball, Gen. List; Oct. 1st. 2nd Lieut. (on prob.) R. A. W. Collet, S.R.; Oct. 30th.

Memoranda.—The undermentioned 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C. Nov. 1st: J. E. H. Bibby, R. W. Fus.; F. Sowrey, D.S.O., R. Fus.; G. H. C. Crooke-Rogers, Worc. R.; E. P. Roberts, R. Suss. R.; T. C. H. Lucas, Suff. R.; H. R. Vagg, Som. L.I.; E. Page, Middx. R.; C. R. Robbins, R.H. and R.F.A.; H. M. Golding, Glouc, R.; S.R.; B. N. Goudge, Leic. R., S.R.; J. D. Canning, N. Staff. R., S.R. The undermentioned 2nd Lieuts. (on prob.) to be Temp. Lieuts. whilst serving with R.F.C. Nov. 19th: C. H. Knight, Dorset R., S.R.; N. Brearley, M.C., Lpool. R., S.R.; D. G. A. Allen, Durh. L.I., S.R. The undermentioned Temp. 2nd Lieuts. to be Temp. Lieuts. whilst serving with R.F.C. Nov. 1st: N. L. Robertson, L. B. Williams, J. W. Shaw. Flight Sergt. F. Adams, from R.F.C., to be 2nd Lieut. for duty with R.F.C.; Dec. 17th. Sergt. H. E. Hotchin, from R.F.C., to be Temp. 2nd Lieut. (on prob.) for duty with the Mil. Wing of that Corps; Dec. 5th.

London Gazette Supplement, December 18th.

Flying Officers.—2nd Lieut. J. S. Brasell, Australian Flying Corps; Nov. 2nd. 2nd Lieut. L. S. M. Page, R. East Kent. Yeo. (T.F.); Nov. 5th. 2nd Lieut. A. T. Cole, Australian Flying Corps; Nov. 7th. Nov. 12th: 2nd Lieut. (Temp. Lieut.) W. Smith, Lond. R. (T.F.); 2nd Lieut. (Temp. Lieut.) J. A. Middleton, East Lan. Big., R.F.A. (T.F.); 2nd Lieut. T. B. Morris, R.W. Fus. (T.F.); Temp. 2nd Lieut. A. N. Leckler, Manch. R., and to be transfd. to the Gen. List. Nov. 13th: Temp. 2nd Lieut. (on prob.) R. N. Dobbyn, Gen. List. Nov. 23rd: Temp. Lieut. G. G. Moore, Gen. List, from a Flying Officer (Ob.); Nov. 24th, but with seniority from June 21st. Nov. 28th: 2nd Lieut. A. W. Hogg, Sco. Horse Yeo. (T.F.); Temp. 2nd Lieut. E. R. Pennell, Gen. List; Temp. 2nd Lieut. H. P. Rushforth, Gen. List. Nov. 29th: Temp. Lieut. W. F. Fletcher, Machine Gun Corps, and to be transfd. to the Gen. List; Temp. 2nd Lieut. S. Blair, from attd. 17th Lrs., and to be transfd. to Gen. List.. Nov. 30th: Temp. 2nd Lieut. A. C. Randall, Bord. R., and to be transfd. to the Gen. List; 2nd Lieut. E. A. Packe, Oxf. and Bucks. L.I., from a Flying Officer (Ob.), with seniority from June 21st; 2nd Lieut. (on prob.) W. F. Dobson, Spec. Res. Dec. 1st: 2nd Lieut. D. J. Honer, W. Rid. Brig., R.F.A. (T.F.); 2nd Lieut. (on prob.) V. T. Norminton, Spec. Res.; Temp. 2nd Lieut. (on prob.) A. Lindley, Gen. List; 2nd Lieut. (on prob.) E. Armitage, Spec. Res.

Flying Officers (Observers).—Lieut. C. Barry, R. Ir. Regt., and to be secd.; Oct. 15th. Nov. 1st: Capt. S. R. Penrose-Welsted, R. Ir. Regt., and to be secd.; Temp. Capt. F. M. Hicks, 10th Hamps. R., and to be transfd. to the Gen. List; Lieut. T. S. Ivens, Ches. R., and to be secd.; Capt. B. G. M. F. Nixon, 41st Dogras, Ind. Army; Nov. 6th. Nov. 10th: 2nd Lieut. (Temp. Lieut.) E. R. Wilkinson, Northd. Fus. (T.F.); 2nd Lieut. J. F. Turner, Ches. R. (T.F.); 2nd Lieut. W. S. Reid, Scot. Horse Yeo. (T.F.); Temp. 2nd Lieut. A. C. Stopher, Garr. Bn., R.W. Fus., and to be transfd. to the Gen. List. 2nd Lieut. V. P. Turner, Australian Imperial Force; Nov. 12th. Nov. 15th: Temp. 2nd Lieut. G. N. Goldie, Arg. and Suthd. Highrs., and to be transfd. to the Gen. List; 2nd Lieut. A. H. Lancaster, Middx. R. (T.F.); Temp. 2nd Lieut. W. H. Winter, R. W. Surr. R.; Temp. 2nd Lieut. J. McDougall, Sea. Highrs., and to be transfd. to the Gen. List; 2nd Lieut. H. W. Bowd, Australian Imperial Force; 2nd Lieut. W. R. Hyam, Australian Imperial Force.

Equipment Officers, 3rd Class.—2nd Lieut. H. C. S. Bullock, Gen. List; Oct. 19th. 2nd Lieut. F. Baxter, Kent Fortress Engrs., R.E. (T.F.); Dec. 6th.

Supplementary to Regular Units or Corps. Royal Flying Corps, Military Wing.—The undermentioned to be 2nd Lieuts. (on prob.): J. T. Rossiter; Aug. 1st. Nov. 21st: R. Lyon, C. N. Le Mercier, I. C. MacGregor, J. A. Paull, L. Cummings, A. C. Hurst, J. B. Carling, J. A. M. Fleming, C. C. Caldwell, A. I. Murphy, C. B. Fisher, L. J. Scott, H. W. Price, W. L. Harrison, A. V. McPhail, J. H. F. Hambly, R. G. Hamilton, B. B. Perry, G. J. T. Young, J. M. Smith, D'A. F. Hilton, H. O. McDonald, G. B. MacQuarrie, F. W. Curtis, W. P. Scott, D. French, J. L. Boles, G. W. Curtis, M. Montesole, W. H. St. J. Perram, R. M. Smith, E. M. V. Fielding. F. Cain; Dec. 2nd. Dec. 8th: E. W. Brooks, T. Moore, R. H. Grant, A. T. Crook, R. A. Trefease, F. A. Thomas, J. Y. Watson. R. C. S. Jamie; Dec. 14th.

Royal Flying Corps (Territorial Force).

London Gazette, December 15th.

Hants Aircraft Parks.—Lieut. (Temp. Capt.) R. Whiddington is seconded for duty with R.F.C.; Nov. 25th.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Killed.

Flight-Lieut. J. D. Hume, R.N.

Accidentally Killed.

Flight Sub-Lieut. S. V. Trapp, R.N.

Accidentally Injured.

Flight-Lieut. R. H. Collett, D.S.C., R.N.
Flight Officer J. P. Everitt, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. H. C. Barr, R.F.C.
2nd Lieut. H. D. Crompton, R.F.A. and R.F.C.
Capt. L. O. Crowther, R.F.C.
2nd Lieut G. W. Dampier, R.F.C.
2nd Lieut. C. E. Morgan, R.F.C.
Capt. T. A. Tillard, Yeomanry and R.F.C.
5385 1st Air-Mech. A. Allardice, R.F.C.

Previously Unofficially, now Officially, reported Killed.

2nd Lieut. R. Barton, R.F.C.

Previously reported Missing, now reported Died as a Prisoner of War in German hands.

2nd Lieut. M. M. Mowat, R.F.C.

Previously reported Missing, now reported Killed.

Lieut. J. A. Mann, M.C., Cameronians (Scot. Rif.) and R.F.C.

Wounded.

2nd Lieut. R. B. Davies, Northumb. Fus. and R.F.C.
2nd Lieut. A. B. Fanstone, R.F.C.
2nd Lieut. E. J. L. W. Gilchrist, M.C., Lancers and R.F.C.
Capt. E. O. Grenfell, M.C., R.G.A. and R.F.C.
Lieut. D. M. Murdoch, Essex, attd. R.F.C.
2nd Lieut. S. Willmett, R.F.C.

Missing.

2nd Lieut. D. S. Johnson, Cyclist Co. Divl. Mtd. Troops and R.F.C.
25178 Sergt. R. S. Evans, R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

2nd Lieut. A. R. Crisp, R.F.C.
2nd Lieut. P. F. Heppell, R.F.A. and R.F.C.
2nd Lieut. G. H. Nicholson, R.F.C.
2nd Lieut. B. W. A. Ordish, R.F.C.
2nd Lieut. R. Watts, R.F.C.
2nd Lieut. W. T. Willcox, W. Yorks. and R.F.C.

Previously reported Prisoners of War, now reported Wounded and Prisoners of War in German hands.

2nd Lieut. J. V. Bowring, S. Lancs. and R.F.C.
2nd Lieut. J. L. Tibbetts, R.F.C.

Previously reported Missing, now reported Wounded and Prisoner of War in German hands.

Lieut. D. Stewart, R.G.A. and R.F.C.

CONSTRUCTIONAL DETAILS—XVI.*

In our last instalment of Constructional Details it was pointed out that the scope for originality in the mounting and cowling of radial air-cooled engines was somewhat limited, owing to the fact that, practically speaking, only one make of engine of this type is in general use—*i.e.*, the Anzani. When, this week, we come to deal with the next type of air-cooled engine, the Vee type, we find that the same complaint of lack of diversity applies almost as much in this case, seeing that the Vee type air-cooled motor is, to all intents and purposes, confined to one representative, the Renault, and its over-much discussed English version, the R.A.F. Without wishing to tire our readers with an attempt to state all the pros and cons. of the R.A.F., a few remarks concerning the problem of effectively cooling an air-cooled engine of the Vee type may be of interest, and help to indicate the reason for the various shields and scoops always associated with the appearance of these engines when in place on an aeroplane.

Arranged as they are in two rows of four or six each, according to the size of the engine, the cylinders cannot, it will be realised, receive a current of air on their front and back sufficient for effective cooling, the following cylinder being shielded by the preceding one. The result is that if the relative current of air due to the forward motion of the machine is relied upon to provide the necessary cooling, the rear cylinders will get much hotter than the front ones, with disastrous results to the power output of the engine. Some additional means must, therefore, be provided to remedy this defect. In the original Renault engines, which were designed for installation in "pushers," the difficulty was overcome by mounting a large enclosed centrifugal fan on the front end of the crankshaft. The space between the cylinders was covered by an arched roof of aluminium running from the tops of the cylinders on one side to the tops of the cylinders on the other. The Vee between the last two cylinders was covered by a vertical aluminium plate. When the fan sucked the air into the space between the two rows of cylinders, the only escape for the air was therefore the small spaces between adjoining cylinders, which were thus cooled on three sides—the inner side and the front and back—by the air delivered by the fan, while the outer sides of the cylinders were cooled by the air current due to the forward motion of the machine. This method of cooling is still retained on M. Farman biplanes and other machines of the "pusher" type, and has stood the test of time admirably. When, however, it comes to building a Renault into a tractor other problems arise.

In the first place the engine is reversed, flying with its propeller end foremost. Unless the fan is to force the air against the relative flow of the surrounding air it would have to be reversed both in direction and in action, seeing that it would now have to exhaust the air from the casing instead of forcing air into it. In the second place, the large helical casing around the fan is of such dimensions as to render it a matter of considerable difficulty to provide space for it in the body of an average tractor machine. Besides, in order to allow the air exhausted by the fan from the space between the cylinders to escape, the portion of the aeroplane body immediately behind the engine would have to be open, a further point against the employment of the fan in a tractor.

The method usually adopted when mounting a Vee type air-cooled engine in a tractor machine is to utilise the relative air current created by the forward speed of the machine without employing any artificially produced auxiliary stream of air from a fan, which latter is, as a matter of fact, left off altogether. The path normally followed by the air around a body moving through it is not, however, in itself sufficient for cooling purposes, as we have already explained, shielding of adjacent cylinders taking place, and means must therefore be devised for directing the air current.

In most tractors fitted with this type of engine the air is directed by scoops or deflector plates in such a manner that it enters the space between the two rows of cylinders from the front, is prevented by a bulkhead or other vertical partition from escaping at the back of the engine, and is forced, by the pressure of the fresh air coming in from the front, out through the spaces between adjacent cylinders. In the older type of B.Es. a simple deflector of the shape illustrated in one of our sketches was employed, but in more recent ones having engines with twelve instead of eight cylinders a somewhat more complicated arrangement is used.

The central sketch in our page of illustrations shows a Renault 8-cylinder engine, with the top aluminium covering open for inspection. At the back of the engine the fan casing can be clearly seen. In the bottom left-hand corner is shown how the Renault is mounted and housed in a M. Farman biplane. This arrangement, with a few minor alterations, is typical of the engine as fitted to machines of the "pusher" type.

Some of the graceful Bristol biplanes designed by Mons. Coanda were fitted with Renault engines, and were of exceptionally clean design as regards their general lines. The way in which this well-known designer tackled the problem of combining sufficient cooling with small resistance is illustrated in our top left-hand corner. The engine was totally covered in, with the exception of the nostril-shaped openings in front and along the sides. The installation on the Flanders monoplanes is illustrated by the sketch in the upper right-hand corner. Here the usual top cover of the engine was retained, air entering the engine housing by way of the triangular openings formed between the downward slope of the upper rails of the body and the engine cover, and escaping *via* the louvres in the side of the body.

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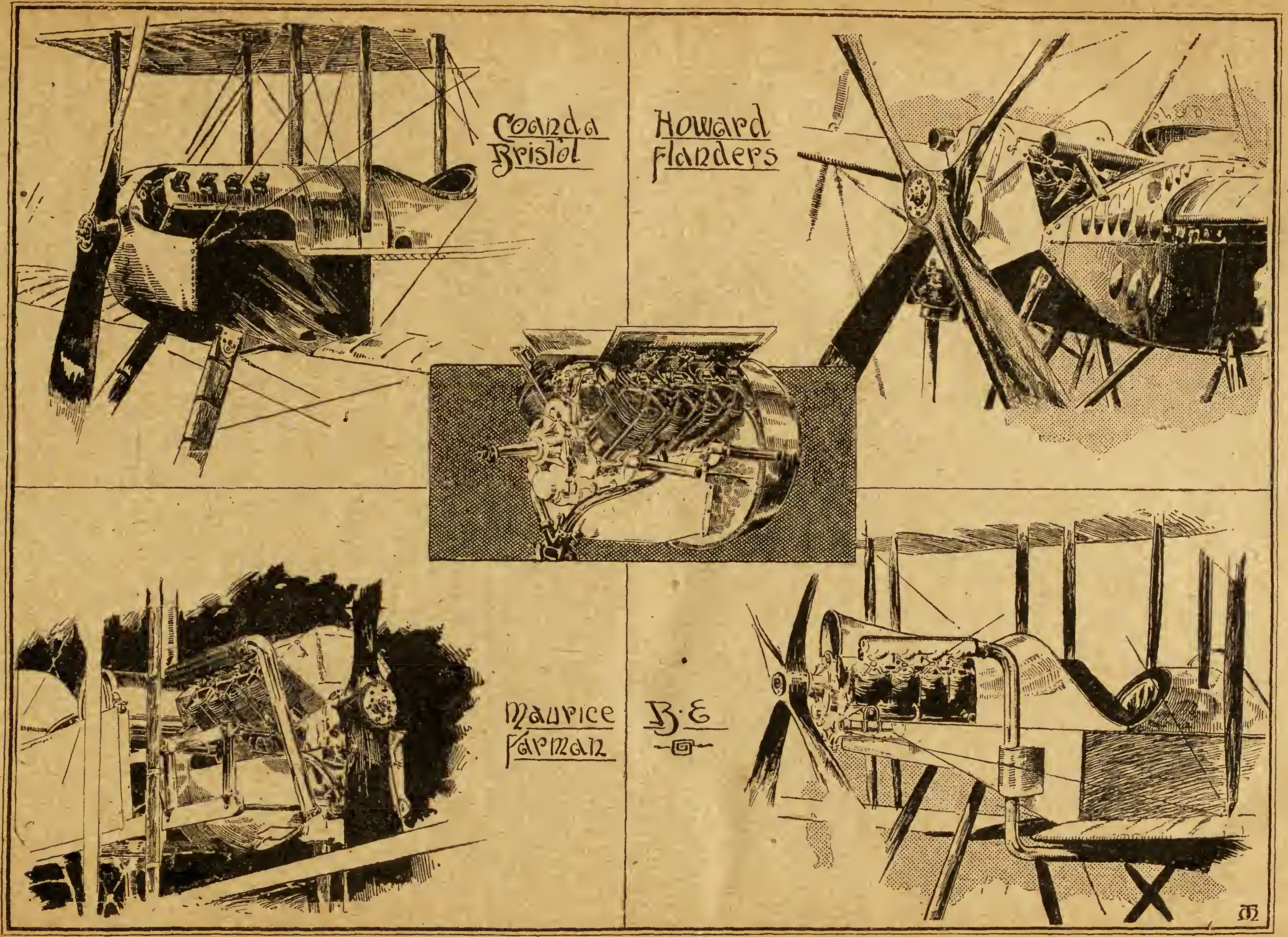
* Previous sets of sketches in this series have appeared as follows:—

Strut sockets	.. Sep. 10	Vee type undercarriages	.. Nov. 5
,, ,, ...	.. ,, 17	,, ,, ,,	.. ,, 12
,, ,, ...	.. ,, 24	Wheel undercarriages ..	.. ,, 19
,, connections, &c. ..	.. Oct. 1		1916.
Wing spar sections ..	.. ,, 8	Engine mountings ..	.. Jan. 6
Streamline struts, sections	.. ,, 15	,, ,, ..	.. Apl. 27
Double-skid undercarriages	.. ,, 22	,, ,, ..	.. June 8
Single-skid undercarriages	.. ,, 29	,, ,, ..	.. Sept. 14

Any of these back numbers can be obtained from "FLIGHT" Office, 44, St. Martin's Lane, price 6*d.* each, post free.

CONSTRUCTIONAL DETAILS.—XVI.



Mounting and housing of Vee-type air-cooled engines. Inset in centre, the Renault engine, showing tubular bearers.

With regard to the mounting of these engines, it will be seen from the centre sketch that the Renault has two transverse tubes passing through its crankcase. These tubes are provided with a threaded portion, where they enter the crankcase, and nuts serve to adjust and lock the tubes in any position relatively to the engine.

On the B.Es. a tubular extension of the upper body rails serve as a support for the transverse engine tubes, which are secured to them by a socket as shown in the sketch. On the M. Farman biplanes the ends of the tubular engine bearers fit into combined sockets and clips bolted to the rails of the *nacelle*. On the Coanda Bristols these tubes were secured to the upper body rails in a similar manner, while on the Howard Flanders monoplanes they were, if we remember rightly, held in sockets on vertical struts in the body.

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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Club House.

After Friday next, the 22nd inst., the address of the Club will be 3, Clifford Street, New Bond Street, W.

The new premises will be open to Members on January 3rd, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

Annual Subscription.

In accordance with the resolution that was passed unanimously at the Special General Meeting of the Members held on the 27th July, 1916, "the subscription to the Club for the year 1917 and thereafter will be £5 5s."

Servants' Christmas Fund.

The Subscription List for this Fund is now open.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

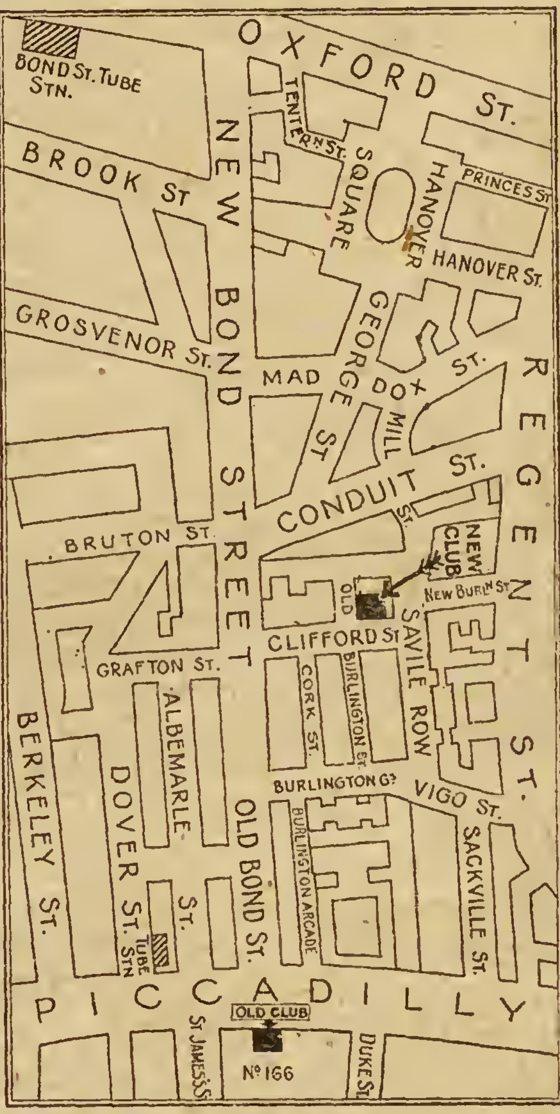
The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.	£	s.	d.
Total subscriptions received to Dec. 12th, 1916	11,098	3	0
Collected at the Westland Aircraft Works, Yeovil (Sixty-first contribution)	0	10	3
Total, December 19th, 1916 ..	11,098	13	3

166, Piccadilly, W. B. STEVENSON, Assistant Secretary.



Plan showing position of New Club Building, 3, Clifford Street, New Bond Street, W., which will be opened on Wednesday, the 3rd January, 1917.

Flying Pay for the Ranks.

An Army Order dated December 15th provides that flying pay at the rate of 2s. a day may be issued continuously to qualified non-commissioned officers or air-mechanics, within limits to be determined by the Army Council, who are specially selected for continuous employment on observation duty, provided that flying pay under this Article shall not be issuable concurrently with flying pay under Article 850 of the warrant dated December 1st, 1914, for the pay, &c., of the Army..

A Gift from Tasmania.

One of the latest gifts received by the Overseas League in connection with their Imperial Aerial Fleet scheme, is an aeroplane and £1,500 from a resident of Hobart, Tasmania.

Captain de Beauchamp Killed.

It was announced in Paris on Tuesday that Captain de Beauchamp, the French pilot who took part in the raid on Krupp's works at Essen on September 23rd, and who also dropped bombs on Munich station on November 17th, had been killed in an air fight in the Douaumont region. His machine fell in the French lines. For his raid on Munich he flew from Nancy, and after bombing Munich, in view of the weather, decided not to fly back; he went on, crossed the Alps and landed in Italy after a journey of nearly 440 miles.

A German Machine at Havre.

Messages from Havre state that a German machine landed on the Plateau de Rouelle, near that town, on December 12th, and the occupants were taken prisoners by some British soldiers.

THE ELECTRIC CONTROL OF LARGE AEROPLANES.

By C. T. GLASS-HOOPER.

Every day sees some advance in the art of aviation, and for the moment the trend of the evolution of the aeroplane seems to be in the direction of larger and more capacious machines, as owing to the extended nature of modern warfare those machines possessing the widest range are of most general use, and wide range cannot be obtained without increase in size.

With regard to the state of affairs when the present conflict is over it may reasonably be supposed that companies will be promoted for the transport of passengers from one place to another—either by means of hydroplanes, where conditions are suitable, or else aeroplanes. In either case the type of machine needed will be one in which many passengers can be carried, as only by carrying a certain minimum number of passengers can any such project be managed economically. The multi-passenger machine is indeed a fact, and there is at least one passenger air service in existence—notably in Florida, where the Benoist boats fly between St. Petersburg and Tampa. This tendency towards large and heavy machines, with consequently increased lifting surfaces, brings the designer face to face with many new problems on the satisfactory solution of which the future of the heavier-than-air machine depends. Not the least important of these problems is the large amount of power needed to operate the controls—that is to say, the increased elevator; *ailerons* and rudder surfaces seem to demand some form of operating gear less fatiguing to the pilot than the cable and lever systems hitherto universally adopted.

It is fairly evident that the time is not far hence when the claims of electricity in the control system may have to be considered, and it is proposed to here discuss its application to an aeroplane.

It is commonly known that if a current of electricity is sent through a solenoid having a core or armature, the armature will be drawn into or repelled out of the solenoid, depending on the direction of the current. If the armature is attached by means of a link to a lever (such as a rudder or elevator lever) it can be made to pull or push it through an arc, and the amount of travel given to the lever can be altered by varying the current passing through the solenoid. Thus a system of controls could be arranged, which it is here proposed to discuss briefly.

A small dynamo sends current through a few secondary cells which are connected through the control board in the pilot's cockpit to the three controls—elevator, rudder and *ailerons*. The current in each of the three circuits can quickly be varied by a regulator and its value read on an ammeter placed in series between the actuating solenoid and the regulator, thus showing in a visual manner what the pilot in a mechanically operated aeroplane feels by means of the pull on his arms.

The dynamo can be driven either by means of an air screw (as an air pump is sometimes driven nowadays) or could be driven from the main engine through some form of clutch, which would allow the dynamo to be released when necessary (as, for instance, it would be if the main engine should fail). In this latter case an air screw is also fitted to the dynamo shaft, so that when the connection between it and the engine is severed the armature can still rotate and generate current. This generator would be of the shunt wound type, a suitably designed shunt allowing a fairly constant potential to be delivered in spite of the varying speed. Solenoids are attached to the fixed portion of the elevator, the armatures being connected to the elevator levers. The number of solenoids needed will, of course, depend on the size of the elevator surface, and will be placed on both sides of the elevator.

The rudder control is arranged similarly, the levers being in the horizontal plane here, and the solenoids are attached to the rudder post.

The *ailerons* control follows the same scheme, and as it is usual to employ two or three *ailerons* on each side, each of these must have its solenoids—armatures and levers—and the solenoids must be wired in series. The casings containing the solenoids and armatures could be below the surface of the wing, possibly attached to the rear spar, and a hole left in the fabric for the link connecting the armature and lever.

When the machine is on the ground and when, in the case of the machine driving its dynamo by means of an air screw as mentioned above, its velocity is insufficient to drive the generator at its minimum speed, some means must be provided for energising the solenoids and permitting the controls to be used. This can be arranged very simply by connecting a battery of a few secondary cells in parallel across the leads from the dynamo, and by this means energy can be stored in the battery when it is being generated faster than it is needed, as it would be when flying for any distance without much alteration of controls, or energy can be given to the system when a heavy demand comes on the controls, such as at landing or turning with a good deal of banking. These cells could be of quite small ampère-hour capacity and consequently small in size, and should be of the unspillable type. With regard to the operating gear in the pilot's cockpit this could be of quite a simple nature, the three controls having large ranges of manipulation. And as there would be no reason for the pilot to have all the controls in his hands at once, there could be three separate switches operating the elevator, rudder and *ailerons*. It could be arranged, however, to make the elevator and *ailerons* controls capable of being operated with one hand simultaneously, as they are at present, should that be preferred.*

It will doubtless be put forward as a disadvantage of a control system such as this that the pilot will not be able to feel by the pull of his controls just what is happening; but this is not necessarily a disadvantage, for although he may not feel the actual controls pulling his wrists or feet, he can see imme-

[* As a matter of fact all the controls are usually worked together so that it might be better to fit control levers of the ordinary type—foot-bar and universal lever—and connect them to the switches regulating the elevator and amount of movement of the solenoids.—Ed.]

diately he starts using his controls just what forces are being called into action and what loads are coming on his rudder, elevator or *ailerons*, as the case may be, by means of the ammeters on each of those circuits, and also the position of his control switches along their arc of contacts shows him at once the relative positions of the control surfaces in just the same way that the angle through which the control lever or rudder bar is displaced shows the pilot how the movable control surfaces are lying.

Should the dynamo fail, although there is no reason why it should not be capable of running continuously for a very long period, the secondary battery will be capable of supplying sufficient current to enable the machine to be brought to the ground. As to the breaking of the circuits accidentally, by a wire snapping or for some such reason, it is a contingency so unlikely as to be hardly worth consideration, and indeed it is not nearly so liable to occur as a control cable in a mechanically operated machine to break, where the cables are always subjected to stress when in action.

The principal advantages of a control system such as that described above would mainly lie in the following points :—

(1) Operation of the controls requires no muscular exertion on the part of the pilot.

(2) Ease with which dual control may be installed.

(3) No need for time to be wasted in tuning up controls, tightening turnbuckles, etc.

(4) No large outside levers and long cables to increase head resistance.

(5) Increased space in pilot's cockpit owing to absence of large and cumbersome mechanical controls.

Only by an intelligent anticipation of future requirements can the British aircraft constructor hope to hold his own in the air when the much-talked-of trade boom arrives, and remembering that the race is to the swift it behoves him to look into problems which at the moment may not seem of great importance but which are bound to arise sooner or later.

It is with the intention of indicating one direction in which design will undoubtedly be altered that these words have been written.

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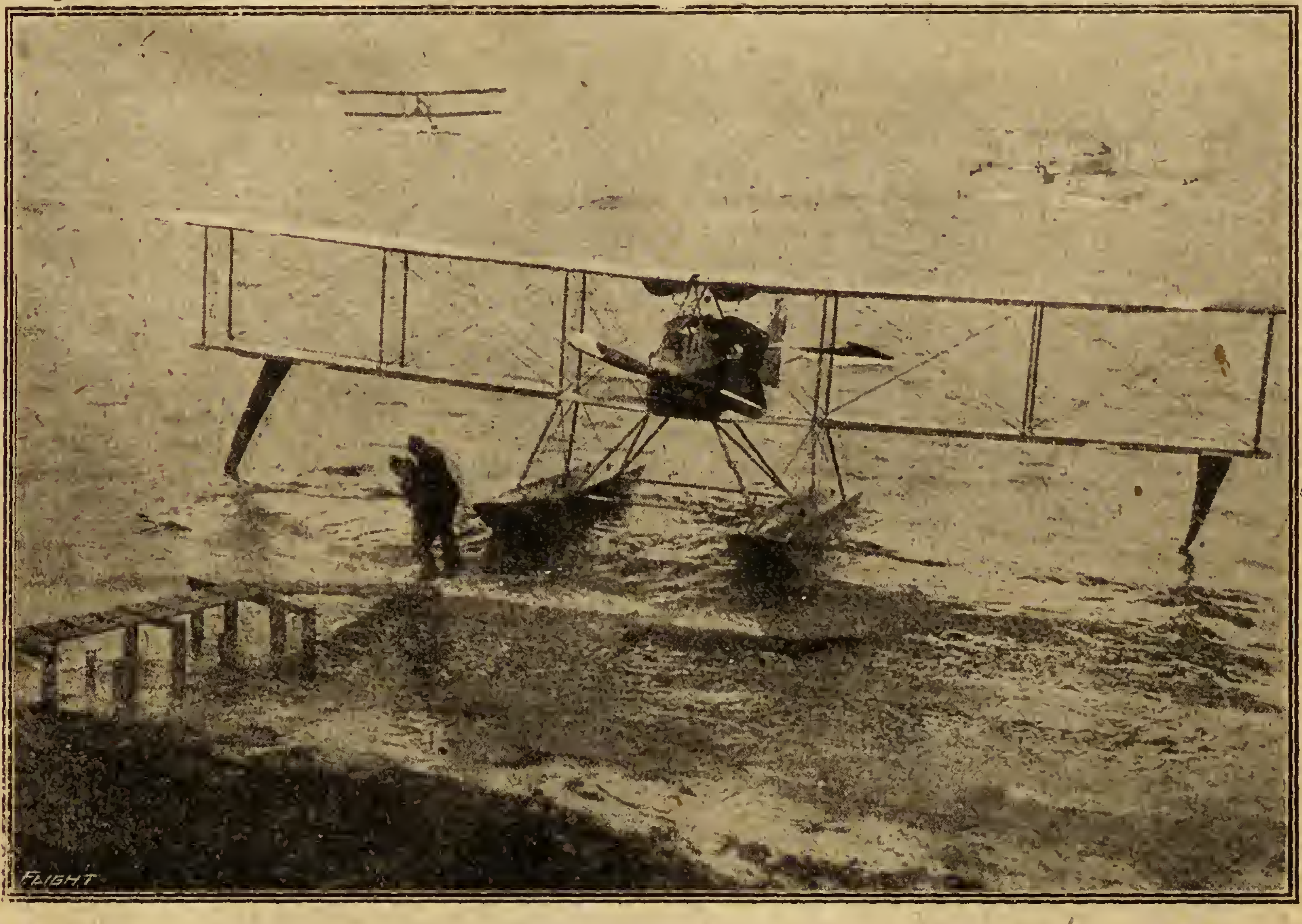
To Train Women Workers at Leeds.

A chance for women in the Leeds district to take up aeroplane war work will be in full operation shortly. It is proposed to follow upon the lines which have already proved so successful in London in preparing pupils for their work. The training will be directed by the Leeds Committee for Training Munitions Workers, under the authority of the Ministry of Munitions. The work is especially suitable for girls who have had a secondary education.

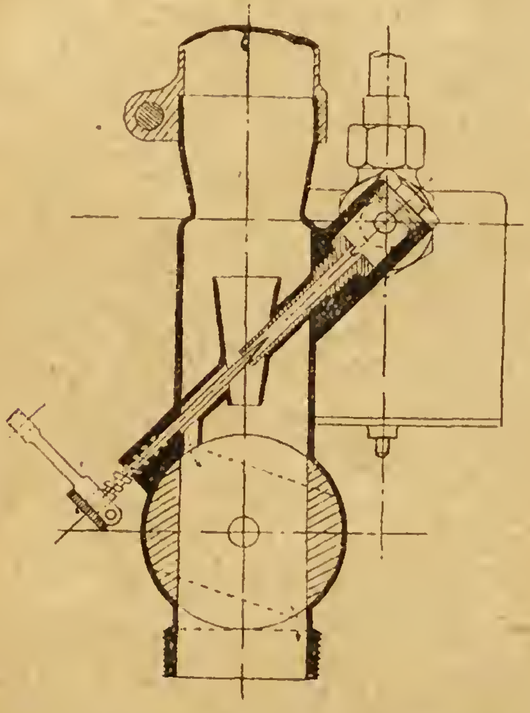
The "school" will probably start about January 2nd at the Leeds Institute, Cookridge Street, and intending applicants should address themselves to the Principal, R. E. Barnett, Central Technical School.



BACK FROM A SCOUTING EXPEDITION OVER THE NORTH SEA.—The pilot is being carried ashore from his craft on returning. The machine is of the F.F. 19 type. (The letters F.F. mean Flugzeugbau Friedrichshafen, the German Naval Aircraft Factory.) In the background will be seen two other machines of a similar type.

THE A.B.C. INJECTOR CARBURETTOR.

One of the most fascinating problems in connection with internal combustion engines is that of producing the correct gaseous mixture to suit the varying loads upon the engine, and special interest therefore attaches to a new principle in carburation which has been thought out by Mr. Granville E. Bradshaw, who is well known in connection with A.B.C. Motors, Ltd., of Walton-on-Thames. In the Bradshaw system both compensating devices—for automatically damping out excessive petrol flow with an increased engine speed, and for increasing the suction on the jet according to the amount of throttle opening—are absolutely progressive, and form a straight line curve. The device has been tested under a great variety of conditions and against well-known makes of carburettors, with most satisfactory results.



Section of the A.B.C. injector carburettor.

Before describing the device in detail, it may be as well to state briefly the two general principles which govern the design of all orthodox automatic carburettors. The first concerns the variations in the proportions of petrol and air which occur as the speed of the engine increases. When, for instance, the load on the engine is lessened, the speed increases (the throttle remaining in the same position), the pressure of air in the choke tube is reduced and more petrol issues from the jet. More air also enters the carburettor, but the quantity is insufficient and the mixture becomes rich. The second principle covers the suction on the jet at various throttle openings. As the closing of the throttle would entail a reduction of the suction effect from the engine, arrangements must be made to increase the suction on the jet, and the variation must be regular, or weak and rich periods will be the result.

In the A.B.C. injector carburettor the object has been to get the full value of the injector principle. From the sectional drawing it will be seen that there are two choke tubes, one placed inside the other in such a manner that the other one induces air into the inner one. By this arrangement it is claimed that as the speed of the air into the carburettor increases, a greater quantity of air is injected into the inner choke tube; and as the jet is situated in there, the pressure round the jet—instead of being greatly reduced, as in the usual run of carburettor, thus permitting an excess of petrol to flow—is slightly increased, and the difference in pressure between atmospheric pressure in the float chamber and the pressure in the choke tube is not so great as would otherwise be the case. In this system there is no "dead" point, as the action is dependent upon the speed of air into the carburettor, which varies according to the revolutions of the engine, so automatically correcting for increased engine speed with a given throttle opening.

The adjustment of the suction on the jet according to the amount of throttle opening is obtained by a small slow running tube, which goes from the side of the inner choke tube to a point near to the throttle when this is only slightly open. Consequently at small throttle openings the suction is concentrated on the jet, and as the throttle is gradually opened the suction is lessened in proportion to the opening. Thus there is no "dead" point or any break in the operation.

The size of the jet is controlled by a needle which is designed to be used as an "altitude corrector" when fitted to aircraft engines, or as a dashboard regulator when used on motor cars. It has a primary adjustment in the form of a knurled head, which allows the carburettor to be readily tuned up for any engine; a limited movement is then given to the jet control covering any desired range between very weak and very rich, and the carburettor being entirely automatic this control need not be varied with various throttle openings and engine speeds. If the jet control, for instance, is set to "weak" the carburation is weak at all throttle positions and at all engine speeds. Similarly if the "control" is set "rich" the carburation is rich at all throttle positions and engine speeds.

It is claimed that the arrangement of the control needle in the slow-running tube considerably facilitates starting from cold. If the carburettor is flooded to the smallest extent, petrol will squirt from the main jet into the slow-running tube, where it will remain by capillary attraction until the engine is cranked over. This small amount of petrol mixes with the air existing in the induction pipe and readily forms an explosive mixture. The system of jet control has also the advantage of being adjustable to give an excessively rich mixture, which is of considerable assistance where self-starters are fitted. or in the case of old engines where starting is difficult on account of air leaks past worn inlet valve stems. Incidentally, another point in favour of the jet control is the annular jet, which is less likely to become clogged than a plain hole, and in the event of a piece of dirt making a slight stoppage the jet lever can be adjusted either to remove the obstacle or to give a slightly richer mixture until it is convenient to clean it out. The jet control also permits the use of different qualities of fuel without resetting the carburettor.

Another favourable consideration in connection with the carburettor, especially for aircraft work, is that the risk of fire is greatly lessened, as there are no open ports near to the float chamber, the only air passing into the carburettor entering at the mouth of the hot-air intake.

There are no moving parts in the carburettor, and an entire absence of adjusting screws, orifices, &c., which are so liable to be tampered with. There is only one variable, and that can be adjusted without leaving the driving seat. The simplicity of the carburettor permits of it being of substantial design, and as there are no intricate parts there is practically no liability to accidental damage.

The float chamber is of standard pattern, but is bolted to the side of the main jet boss, so that this can be turned through an angle of 90 degrees. As the jet is at an angle of 45 degrees, the carburettor can be used as a "horizontal" or "vertical" at will, and the level in the jet remains constant for either position.

The carburettor is to be marketed in the following sizes: 20, 25, 30, 36, 42 and 48 mm.

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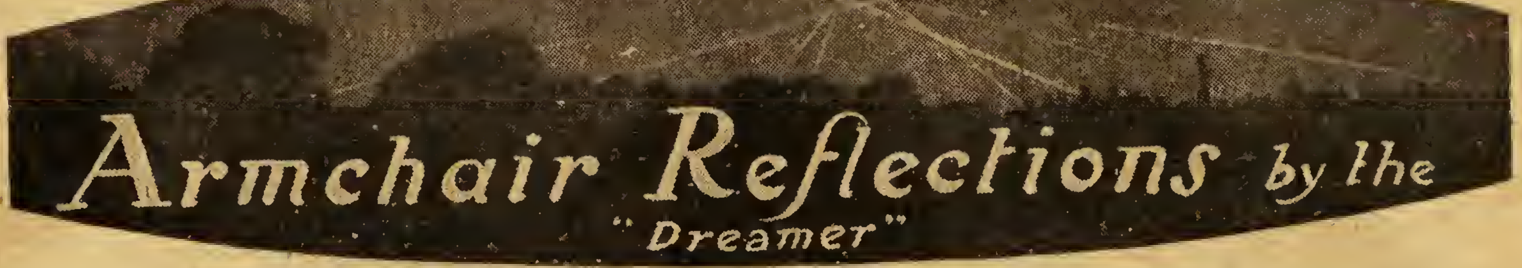
Aeroplanes and Meteorology.

At the annual meeting in Edinburgh on December 13th of the Scottish Aeronautical Society a paper on "Weather Observation from an Aeroplane," by Lieutenant C. K. M. Douglas, R.F.C., was read. Having been fortunate enough to be for some months this year almost daily amongst the clouds of Northern France, Lieut. Douglas had studied the formation of both stratus and cumulus clouds at close quarters, and submitted some records of the temperature and other conditions under which they developed. A cumulus cloud, which was the visible evidence of a stream of rising air, might give rise to a thunderstorm. Unless, however, the fall of temperature from the ground upwards was very great thunderstorms would not develop. A knowledge of this temperature gradient was thus very important in the prediction of thundery weather, and Lieut. Douglas put in a plea for the use of the aeroplane in peace time for this purpose, as, in addition, the field of view at a height moderate for an aeroplane was so extensive that distant thunderstorms could easily be observed. He himself had seen clouds 100 miles off from a height of 8,000 ft. The observations made had been quite secondary to observations of a military character, and represented only a very small part of what could be done for meteorology by aeroplane observers.



Armchair Reflections by the "Dreamer"

Once upon a time we went to war, not because we wanted to, but because we had to. Fact of the matter is we had put our name to a little scrap of paper, and when the time came to honour it we started in to do our best.

Just how long ago it is since Germany struck the match that set fire to three-quarters of the world, I have some confusion of thought. It seems to me that it was in the days of my youth, that August Bank Holiday meeting at Brooklands, when there was more talk of war than of racing, when as the big cars flew round the track we all realised that the present was the last racing we should be likely to witness for some considerable time.

For years, it seems, my newspaper used to keep me posted. "Six hundredth day (or was it year ?) of the war," it said. "Thirty-fifth day of the battle for Calais. Ninetieth day of the fight for Verdun." It all appears away in the distant past. The newspapers have lost count. Yet I know that we are still at war. By the men in khaki who crowd our streets and trains, by the women doing men's work, by the price of commodities, it is borne in upon me at every hour that we are still at it. I know what it is we are fighting for. Summed up into one word it is Peace, yet when those placards the other day announced that Germany was open to talk peace, the news left me cold.

Germany and peace. Somehow the words do not fit together properly. There does not appear to be any connection of thought. Yet the day must come when peace is with us again, though whether within the next few weeks, months, or years, I do not pretend to guess.

Well, we know what the war has done for aviation ; I wonder what peace, when it comes, will do for it. Shall we ever, I wonder, go back to anything resembling the old days ? Will Hendon and Brooklands once again become the centres of fashion and sport in the English world of aviation ? I think so myself, only even more so. I see no reason why they should not. We are a peace-loving nation, really, although ticketed a warlike race. It takes about a couple of years, usually, for us to get going all out in any war it may happen that we are involved in, but sport comes to us naturally.

Of course, things will be different, almost everything will be after this upheaval. It seems to me that few things will be exactly as they were before. A friend of mine with a business in the City which in pre-war days gave employment to nearly a hundred men, was speaking to me the other day about what would happen in his own particular circle "when the boys come home."

It so happens that something like 80 per cent. of his hands have joined up with the Colours, and as his is a business employing men of good standing, most of them are now holding their King's commission. He says he cannot for the life of him see Captains and Majors getting back to their desks as plain Mr. this or that, whilst a one-time junior, now wearing the V.C., will in all probability object to being ordered about in the usual way.

Something very similar has happened in aviation. Most of our old Hendon and Brooklands pilots are now away up the tree of promotion. In their case, however, the way is easier, for there is every possibility that most of them will remain in the service of their country. The war has taught the world the value of the aeroplane in warfare, and there is little doubt our flying services will continue to grow and grow when peace is declared, so that there will be plenty of room, not only for those already joined up, but also for those "Pups" now in training to take their place in the R.N.A.S. or the R.F.C. according to their fancy, although one or other, or both, of these services may be called by a totally different name when we have got time to settle matters on a new footing.

Then there are many who are not keen on fighting, many whose breast is not bursting in its endeavours to expand to make room for medals and crosses. These will be the civilian pilots of the future, and there will be plenty of room for those also. But I I think the old days of racing round pylones (what a time it is since I wrote that word) are gone for ever. Our ideas have expanded so greatly under a knowledge of the mighty things standing to the credit of aviation, that we can never again content ourselves with anything so paltry as pylone flying. The menu submitted to us will have to contain dishes much more encouraging than that. London–Manchester–London, and London–Paris–London, were actualities before the war ; although they were doubtless great events, in the days to come such trivial jaunts will possibly be but the small fry of aviation meetings. This is no great flight of fancy. What I am suggesting as the possible programme of the future does not mean the bridging of nearly such a gap in progress as that separating the Manchester flight of Paulhan and Grahame-White, and the flight over the same course with the return journey added, which fell to the credit of our old friend Brock.

I believe in the days to come we shall have aviation meetings held in such style that those we knew of old will be as nothing ; but this, of course, will be after the war, which is not so near, in my opinion, as some people allowed those posters the other day to lead them to think.

To suggest peace is one thing, and to come to peace terms quite another, and if we are going to stick to our word, there are many things for which a reckoning will be required from Germany, things which will be unsavoury to her, yet on which we have sworn that a reckoning shall be had.

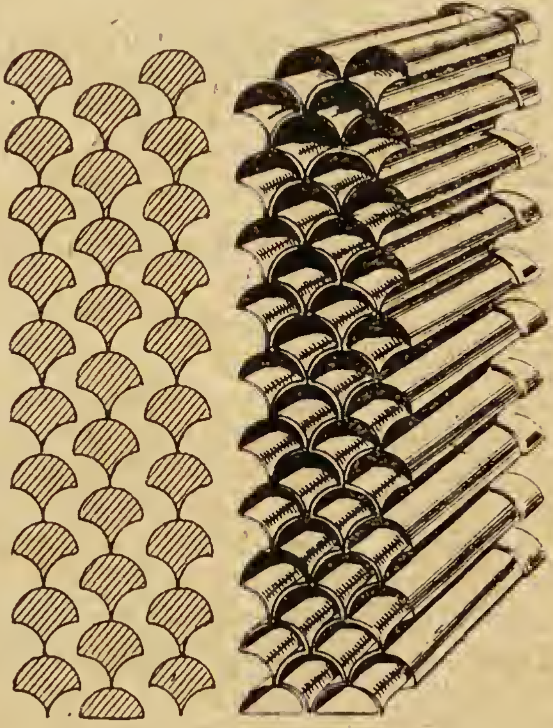
THE GALLAY RADIATORS.

WITH the ever-increasing demand for larger and larger engines, power and yet more power, water cooling comes to the fore in the aviation world in much the same manner as it did in the early days of motoring. Already the limiting size of which it is advisable to make an air-cooled cylinder are fairly well defined, and when this has been reached, as it undoubtedly has in several air-cooled engines, an increase in power can only be obtained by a corresponding increase in the number of cylinders. Here, again, the number of cylinders which it is practicable to incorporate has its limitations, whether the engine be of the Vee, radial or rotary type. Logically, therefore, unless some new principle of air cooling, either by a scavenging stroke or other means, is introduced, it would appear that water cooling will have to be resorted to for the high-powered engines with which our pilots will have to be equipped if they are to have a fair chance of meeting the Germans on a level footing—literally as well as figuratively speaking—in the struggle for supremacy.

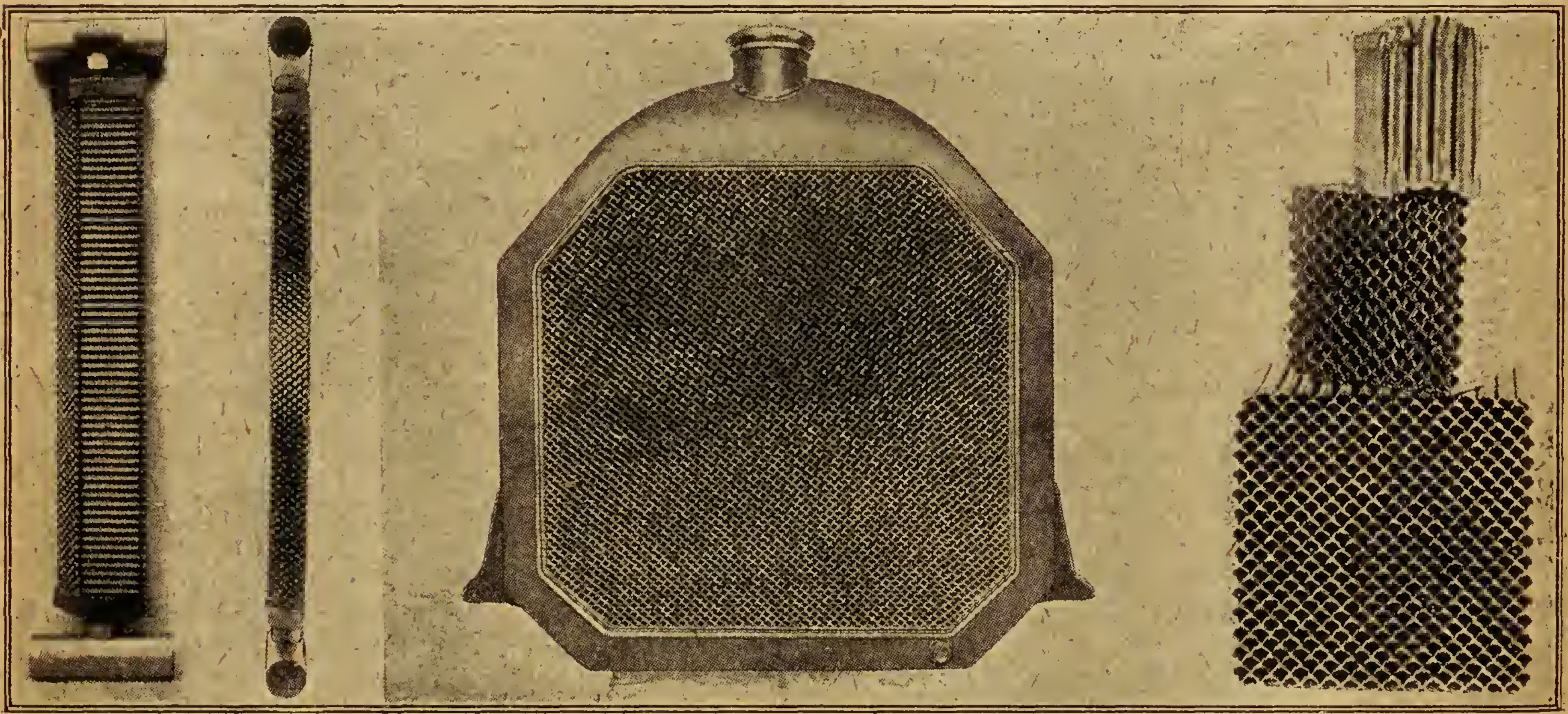
That a great deal of experimental work will have to be done, in order to determine the best ways and means of effectively cooling these larger engines, goes without saying. Much will yet have to be done in the way of determining how the greatest cooling effect may be obtained with the smallest amount of resistance, and this would appear to be a subject for such an institution as the National Physical Laboratory rather than for a private manufacturer.

In the meantime, the motor-car radiator can be fairly easily adapted for air work, has, of course, already been so in a number of different types of aeroplanes, although we should not like to say that in so doing the maximum of efficiency has been attained. According to present practice there can be little doubt that the honeycomb type of radiator holds the lead, whether it be mounted in the nose of the machine or elsewhere. In the absence of wind-tunnel tests it is difficult to say whether the square tube, round tube or other formations are best as regards the ratio of cooling capacity to wind resistance. At any rate, on the face of it, it would appear that the form, in which the normal area presented by the walls and soldered spaces between adjoining tubes is the smaller, would be the more efficient.

A form of honeycomb radiator which has won great popularity in the motoring world, and which is coming more and more into prominence on modern aeroplanes is the Gallay radiator. A visit to the Gallay works in Scrubbs Lane, Willesden, reveals some highly interesting facts concerning the design and process of manufacture of this type of radiator. This subject is one on which it is at present difficult to say enough and, yet not say too much. Many of the most interesting points cannot, for obvious reasons, be touched upon. However, a brief outline of the principal



Diagrammatic Sketch of the Gallay radiator construction.—On the right is shown a section of the radiator with water passages and air channels, while the diagram on the left indicates the method of building up the honeycomb of separate strips.



A FEW EXAMPLES OF GALLAY RADIATOR CONSTRUCTION.—On the left is a Gallay radiator of the standard unit type. The necessary cooling area is provided by adding the requisite number of units for the engine and speed in question. For the same engine, if the speed is greater the number of units is reduced, if the speed is smaller the number is increased. The honeycombs are pivotally connected to the top and bottom water leads, so that by suitable adjustment the rear units can be brought out of the path of the front units. The photograph in the centre shows a Gallay motor car radiator. Note the exceptionally "clean" appearance of the honeycomb. On the right are three sections of the Gallay radiator. At the bottom a 6 ft. 6 in. section showing the semi-circle and quarter-circle formation peculiar to the Gallay radiator. In the centre is a sectional view of the honeycomb, showing clearly the shape and relative size of the water passages. On top is a section of a pointed radiator, lying on its back, in order to show how adjoining strips are staggered relatively to one another to provide the pointed form. This section also shows how the water passages are formed by stamping out the ends of the tubes bell mouth fashion.

features may be permissible. Geometrically the Gallay radiator is very simple, the water spaces consisting of a series of semi-circles and quarter-circles. Reference to the accompanying illustrations will, we think, make this point clear. Each air channel is formed of an endless strip of brass, or, more correctly speaking, of a strip, the ends of which are folded over and joined on a highly ingenious machine. This strip is then placed in a press, on the design of which, by the way, the firm have spent a considerable amount of time and money. In this press the strips are given their typical Gallay formation, and all that remains to do to complete the honeycomb is to solder the ends of adjoining strips together. Owing to the peculiar shape of the corrugations this is a simple matter, since there is no tendency for individual tubes to slip, a difficulty often experienced with round tube types. The strips are placed side by side in the requisite numbers, and are lightly clamped together, ready for soldering. This is done by "dipping" the ends in a shallow tray in which there is just the right depth of melted solder. When finished, the radiators are tested for leaks, of which very few are found, owing to the initial rigid inspection of the brass bands over a box with glass top and in which are placed a number of electric lights. Even the smallest pin hole is instantly discovered during this inspection, and the possibility of a faulty strip finding its way to the presses is very remote.

From our illustrations it will be seen that the edge left between adjoining tubes is very thin indeed, and the amount of solder used, although quite adequate for its work, is reduced to a minimum, no superfluous solder being left anywhere. As to the resistance per square foot of this formation no information may be given under present conditions, but some rough and ready tests showed that the tubes obstructed the flow of air to a surprisingly small extent. As already mentioned, this firm are making large numbers of motor-car radiators, all the usual forms, such as flat, rounded and pointed, being possible with the Gallay formation. A point in favour of this radiator is that it can be built up in units or sections of almost any size from a couple of inches square to several feet square. More than that, repairs are quickly and cheaply effected, a damaged section being simply removed and a new substituted, or, if necessary, a single damaged tube can be replaced without disturbing the rest.

One of our illustrations shows a new departure in aero-radiator design, at any rate as far as this country is concerned. It consists in building up the radiator of a number of standardised units, in such a manner that, for a given engine, a certain number of units are employed. If the same engine is used on a faster machine fewer units are employed; if on a slower one, more units. This arrangement follows, it will be seen, along the lines of the German Pazet radiator described in "FLIGHT" of December 31st, 1915. A few moments of consideration will suffice to show the advantages of this arrangement. Instead of a different size and shape of radiator for almost every type of machine, varying even in the same machine according to the engine fitted, we have with the unit system a standard unit that can be turned out in quantities without thought of the machine on which it is to be mounted, which is merely another way of saying that it can be manufactured economically and, what is of greatest importance of all at present, quickly. To the Gallay Radiator Co. belongs the credit of having realised the possibilities of the unit system, and it is to be hoped that the authorities will give this method their serious consideration.

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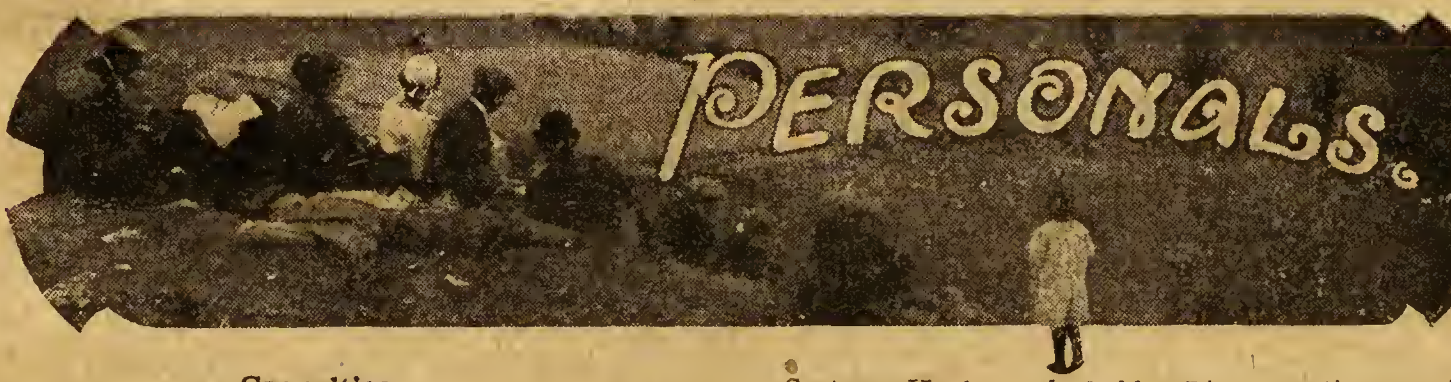


Casualties.

Second Lieutenant GEORGE EDWARDS, R.F.C., aged 28, previously reported missing, now officially reported killed while flying over the German lines on September 24th, was the second son of the late George Edwards, 134, Kingsland Road, N.E., and of Mrs. Edwards, "Cedar Mount," Mottingham, Kent.

Second Lieutenant GUY HEDDERWICK, Dragoon Guards, attached R.F.C., previously reported missing on September 22nd last, now officially reported as having died on active service, aged 22, was the eldest son of Mr. Philip Hedderwick, of the firm of Stanley, Woodhouse and Hedderwick, solicitors, of Essex Street, Strand He was educated at Uppingham, and was articled to Messrs. Budd, Johnson and Jecks, of 24, Austin Friars, solicitors. On the outbreak of war he joined the Westminster Dragoons, and served with that regiment in Egypt for one year. In August, 1915, he was gazetted Second Lieutenant in the First Reserve Cavalry, and transferred to the R.F.C. in May last. He joined a squadron at the front on September 7th and was engaged in an offensive patrol on September 22nd, when he was attacked by several enemy aircraft at the same time and forced to the ground in the German lines.

Flight-Lieutenant JOHN DOUGLAS HUME, R.N., reported killed, was the only son of the Rev. David Hume, M.A., Buckhaven, Fife. He was 20 years of age, and was serving his time as an engineer when war broke out. Last spring he was attached to the Persian Gulf Expedition, and had several exciting adventures before his health broke down. Latterly he was on duty in this country.

Captain PHILIP ALGERNON TILLARD, Yeomanry and R.F.C., killed, was 34 years of age, and was the elder son of the late Mr. Philip Tillard and the late Mrs. Bonham Carter. He formerly held a Lieutenant's commission in the Royal Fusiliers. In 1913 he joined the Yeomanry, and was promoted in March of last year.

Married and to be Married.

The marriage of Captain W. B. BRYANS, Norfolk Regiment, attached R.F.C., younger son of Mr. and Mrs. A. Bryans, 8, Talbot Square, Hyde Park, with MILDRED ISOBEL, youngest daughter of the late Lieutenant T. RAMSBOTHAM, R.N., and of Mrs. RAMSBOTHAM, Enniskerry, Exmouth, will take place on January 20th, at 2.30, at St. James's, Sussex Gardens, W.

The marriage of Lieutenant CHARLES HURD HOWELL, R.F.C., and MARGARET RUSSELL, daughter of the late ex-Governor William E. Russell, of Cambridge, Massachusetts, U.S.A., and of Mrs. Michael Foster, of Harrogate and San Remo, took place last Tuesday, at Holy Trinity Church, Cambridge.

The marriage took place on December 12th, at St. Saviour's, Westgate-on-Sea, of Lieutenant ROBERT PEEL ROSS, R.N. (Squadron Commander, R.N.A.S.), only son of the Rev. R. Peel Ross and Mrs. Peel Ross, of Druim, Inverness, and grandson of the late Captain Horatio Ross, of Rossie Castle, Montrose, to Miss MURIEL KINNARD, youngest daughter of Mr. E. H. Kinnard and Mrs. Kinnard, of Clevelands, Westgate-on-Sea. The bride was given away by her father, and Flight-Commander C. Butler, R.N.A.S., was best man.

Captain ALAN MACHIN WILKINSON, D.S.O., Hampshire Regiment and R.F.C., was married to Miss LINA SNELL, at St. Barnabas Church, Addison Road, Kensington, last Monday.

AVIATION IN PARLIAMENT.

Air Raid Insurance.

MR. INGLEBY in the House of Commons on December 14th asked the Prime Minister whether his attention has been drawn to the remarks of Mr. Justice Sargeant in giving his judgment in the case of Enlayde, Limited, *v.* Roberts, with reference to aircraft damage insurance; and whether, to allay public anxiety on the subject, he is prepared to state that the benefit of insurances against aircraft damage effected with the Government shall enure for the benefit of, as well as the persons in whose names such insurance may be effected, as also of all other persons interested in the insured premises?

Mr. Roberts: The Prime Minister has asked me to answer this question. My attention has been called to Mr. Justice Sargeant's judgment, and I would refer the hon. gentleman to the answer given on this subject to the hon. member for Marylebone East on December 1st, of which I am sending him a copy.

Air Policy.

SPEAKING in the debate on the Vote of Credit in the House of Commons on December 14th, Mr. Billing said: "I should not occupy the time of the Committee if I thought there would be any opportunity of raising the question of the Air Service before the House adjourns. I quite realise that the new Government—I should like to be among the first to congratulate the new Government—has before it many tasks of greater magnitude, but I would like to ask the present Government that at least they should not take a very definite decision—I am looking to this new Government to take definite decisions—before there has been some debate in this House on the reconstruction of our Air Services. I am sure that the majority of the members of the Committee agree that a reconstruction of the Air Service is absolutely necessary, even more necessary now than it was twelve months ago. The position is more critical to-day, and the employment of a great Air Service is even more important to-day than it was twelve months ago. So far as I can see, the position is this: At the present moment we have a Naval Air Service, whose operations, such as they are, are under the direction of a Lord of the Admiralty. It is not in a position to carry out great operations because of the very reason for its existence—that is, to provide the eyes for the Fleet, because they have not the material for that purpose. They have a great personnel. Their existence as a Naval Air Service is rather difficult. On the other hand, there is the Royal Flying Corps, which is doing excellent and wonderful work in France under the direction of the War Office. The construction of machines is most important. The control of inventions as regards new types, which we are obliged to keep up to date, is one of the most important things. Owing to the friction that has arisen between the various services—the Army and Navy, the Flying Corps and the Naval Air Service—they have now decided, I understand, to put the construction in regard to this highly technical science in the hands of the Munitions Department. I should like to register a protest before that is done. I know the feeling of the whole of the trade in this country. I know that certain officers have had complete control as regards construction both on the naval and the military side. It has been a mistake from the beginning to allow officers of varying rank to have the control of the design and construction of aeroplanes, for the simple reason that on all these Committees that are set up we find a young officer, probably with one stripe on his arm, who is a master of the subject, having to oppose another officer with four stripes on his arm who has only just taken up the work, with the result that there has been and always will be confusion.

"We are not going to solve the question by handing it over to the Munitions Department. To whom in the Munitions Department are they going to hand it over? It is a highly technical job, and it is quite a new science. Are they going to hand it over to officers, because practically every man in this country who understands the science of aviation is an officer, and is either in the Army or the Navy or has joined up. Are they going to take men who are experts from the Army and the Navy, or is the Army to lend them all the experts or is the Navy to lend them all the experts? I should like to ask the Government—and I do it in no carping or critical spirit—to think very seriously at the present moment, and when the reconstruction of what is or what should be a great offensive service is in the melting pot, not to take the easiest way out. The easiest way is not always—indeed, it is very rarely—the way out. We must have an Aircraft Construction Board, and it would be preferable if that were completely in the hands of civilians. If the construction of aeroplanes, the deciding of the types and the giving of orders is going to be made piecemeal in the hands of the Munitions Department, it will simply make another Department, and you will have to take officers from the Army and Navy or the constructive side of those sections to form that Department. I can assure the Government, from inside knowledge, that if that is done, the Department will not serve and the petty jealousies and that sort of thing which we want so much to defeat will occur. An hon. member opposite, in certainly one of the most stirring speeches I have heard in the House for a long time, raised the question of personalities in clubs. It is the same inside the Services, as a good many officers know. The whole question is, not what shall we do, but who shall do it? The most important thing to decide, after deciding what shall be done, is to start with quite an unbiassed mind as to who is the most capable of accomplishing the task, quite apart from what he is or how many stripes he may have on his arm or how many stars he has on his shoulder. That is how I look at the matter. The position now is highly critical.

"A good deal has been said this afternoon on the question of the submarine peril. I would point out that submarines have to go somewhere to get supplies, and that they have to be constructed somewhere. I would suggest that the submarine is best tackled before it starts out or goes home. Surely our Admiralty are in possession of the facts. They should be in possession of charts and maps as to the position of the submarine bases. I do not want to mention numbers, but I can say that at the present time we have thirty or forty or a hundred or a hundred and fifty times more machines in the Naval Air Service than we had two years ago. We do not know what to do with them. We are lending some squadrons to the Army and are lending other squadrons to co-operate with the French. I would point out to the present Government that it is a mistake to say, "We have got three or four thousand machines which may be required; what shall we do with them?" I am going to suggest something. Fifteen per cent. of the personnel of that Service is being employed at the present time under war conditions. I would ask the First Lord of the Admiralty, so far as the Naval Air Service is concerned, to make a point of employing new squadrons in raiding submarine bases. There ought not to be a day or an hour, having machines of the type that we possess and plenty of them, when the enemy submarine bases are not being attacked. We ought to make submarine attacks impossible by constant and persistent raids—not by intermittent raids, say, one in three days. There is no need to report the raids in the newspapers. There should be one incessant raid of those bases where submarines and enemy destroyers are operating.

"What is even more important is the preparations we are making, both in regard to the policy of construction and the policy of aggression, with regard to the air in the future. I do not want to repeat now any remarks I have made in this House on previous occasions, but I should like to point out that we have in this country at the present moment facilities for producing in the next six months five thousand aeroplanes without interfering in any way with the other munitions of war. If an Aircraft Construction Board could be set in operation you could have those machines in six months, if the design were standardised. I am quite aware that there is a danger of standardising the design for fighting machines or for observing machines, because if the enemy improves on that type of fighting machine he puts you out of the running. But there is no danger in standardising the design of a bomb-dropper. If a machine has a speed of eighty miles and is capable of carrying two, three or five hundredweights of explosives, provided it is accompanied on its raids by the latest type of fighting machine which is equal or superior to that of the enemy, there is no danger in standardising it. If we are going to produce them in any large number, we must back some design. You can never produce in great number by constantly changing the type. If we standardised the best type of bomb-dropper we might in six months very easily have five thousand aeroplanes of that type without in any way interfering with the output of munitions in this country, with the exception of the engines. I endeavoured to persuade the late Government, and will endeavour to persuade the present Government, that with respect to the engines we must look to the American market. We cannot, I am confident, produce the engines in this country that we want for the job without seriously interfering with the output of munitions which we cannot get abroad and which are urgently needed. I am suggesting the method, not of taking the American engine, but of standardising the English engine and taking over the American shops for producing it. The only point to be considered is the practicability of doing it.

" We can have the pilots at the same time. I have been trying to persuade the Lords of the Admiralty since December, 1914, that we were wasting our time in training pilots in this country. I have pointed out to them that my experience of aviation has shown me that it is a fortunate day when a young learner gets on an average four minutes in the air in England. In the initial stages of learning to fly, the atmospheric conditions must be more or less favourable. The result is that these young fellows are waiting about the aerodrome for their turn or for the weather. You can go to these places and find fellows who have not been up for a week. I understand that we have approached the French Government, that we have got their permission, and that after twenty-eight months of war and twenty-four months of persuasion someone has gone to the South of France to see if he can select a site. I would persuade the Government to take the matter in hand and to put it in charge of somebody. It does not matter whether it is under the Army or the Navy. Get rid of the intrigue in every way you can. Make it somebody's job—a civilian's job—to go to the South of France and provide facilities for training 500 pilots a week. That is a sweeping statement, but it is possible that with 100 machines—I say that we have now in this country 2,000 machines that could be employed—or 200 machines in the South of France, where the climatic conditions are favourable, we could be training pilots for twelve or fourteen hours a day, instead of merely early morning and afternoon, as we do at home. I would ask hon. members to consider what might have happened if we had started in February of this year a definite constructive policy, always having at the back of our heads a definite offensive policy, after consultation with those men who have had experience in operations in the field or in operations of bombardment by aeroplane, and to consider what we might do with 5,000 aeroplanes. What a different complexion we should have put upon the War? To carry out what I propose would create a public opinion in Germany, and would show that we were really carrying the war into their country. That was a view which I stated some time ago, and if it had been adopted six months ago, or even two months ago, we should have had this air service. The task is not an insurmountable one in any way.

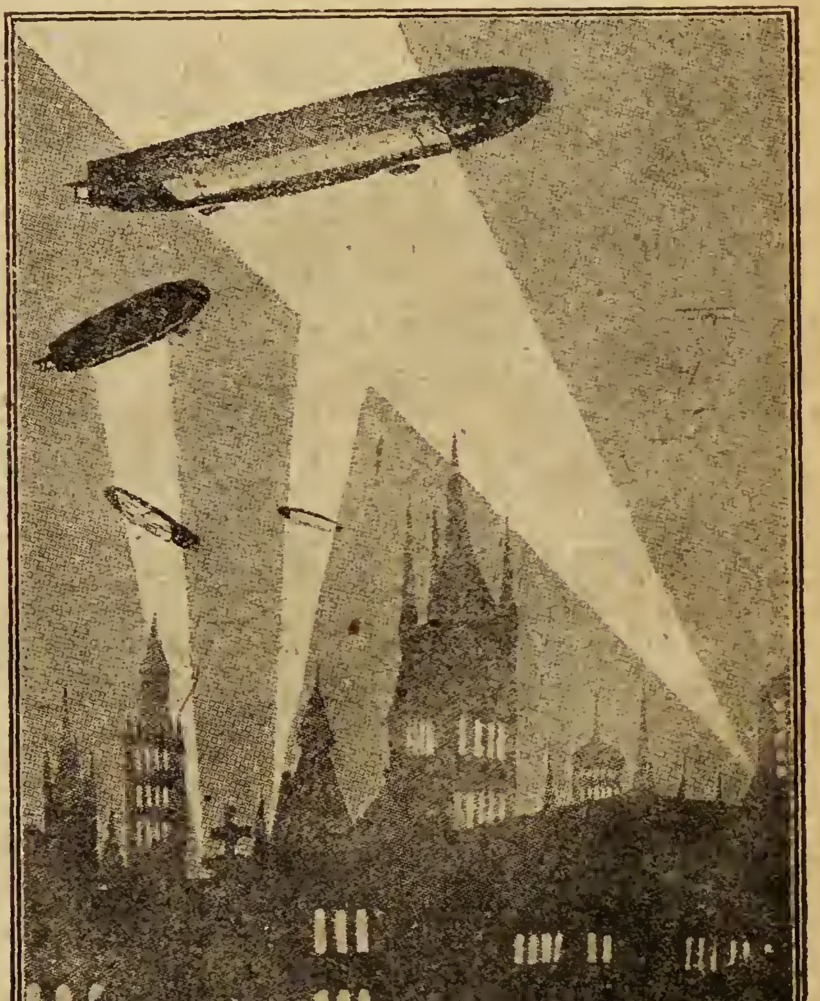
" I have been asked when I thought the war would be over, and my reply was that I thought it would be at an end twelve months after the Government wakened up; and I can assure hon. members that if only we took up this question of the air service seriously now, in six months' time we should be able to introduce a greater offensive still. It is because I believe this so seriously—and my belief is not founded on mere ideas but upon experience—it is because I believe in the possibility of a great air service, that I beg the Government to take the whole matter seriously into their consideration directly the opportunity arises. I beg them, however, not to take a short cut by handing the construction of aeroplanes to the Munitions Department or to anybody willing to undertake it. In France, the Army has every machine it wants, and I ask the Government to give to the Army or the Navy every machine it wants, where it is proved that it would be of value to either. In regard to the Naval Air Service there is no justification for employing a gigantic personnel—no reason either on earth or on the sea. I would comb out some of them, as well as some of the Royal Flying Corps, and I would ask the Government to form this air service, and call it an Imperial air service if you chose, but it is no matter what you call it so long as it is created a separate service, a unit apart from the Army and the Navy, as a great aerial offensive service, which could operate under the direction of the Army, if you like, or it could be left to the Navy when necessary. But, without being critical of the Naval Air Service and its functions, or of the Royal Flying Corps, I submit that they are not the material which is wanted. There are firms in this country which are still competing with each other, and the Naval Air Service, the Royal Flying Corps, and now incidentally the Munitions Department, are concerned in this matter. I submit that the present Government should make a clean sweep, as they can do before any influences are brought to bear in one way or the other, and proclaim its intention of creating a Ministry of Construction or a Board based on the same principle as the Naval Construction Board, and this Air Construction Board would then be solely responsible for supplying the wants both of the naval branch and the military branch of a great Imperial air service, which I sincerely trust before the end of the war will come into being."

Parliamentary Secretary for the Air Board.

Speaking on the second reading of the New Ministers and Secretaries Bill in the House of Commons on December 18th, Sir G. Cave said: " We propose by the Bill to appoint a Parliamentary Secretary to that Board. The Government desire to go somewhat further than that. This matter is, of course, of great and pressing importance, and I think many of us would desire to have a decision as to the position which the Air Board is to take. I am authorised by the Prime Minister to say:

" 'In the pressure of work involved in the formation of the Government, it has not been possible to decide to-day all matters connected with the Air Board. The work of President is still being carried on temporarily by Lord Curzon, and the Government have satisfied themselves that the service is not suffering in the interim. But I am glad to be able to say that the two fighting Departments (the War Office and the Admiralty) have arranged to utilise to the full the services of the Air Board, and I hope in the Committee stage to be able to introduce Amendments to give effect to that decision.'

" I hope that with that statement the House will be content."



How the Germans report for home and neutral consumption their aircraft as strafing London, as conceived by the Japanese artist "Hashimoto."—*From the Japanese " Aeronautic World."*

AIRISMS FROM THE FOUR WINDS.

The Final Report of the Committee, presided over by Mr. Justice Bailhache, on the Administration of the R.F.C., was laid on the table of the House of Commons on Tuesday, and was issued to the public on Wednesday evening. It favours considerable development of the Air Board.

* * *

In the death of Mr. R. A. Yerburgh on Monday at the age of 63, Imperialists have lost a great and enthusiastic worker. As President of the Navy League for the past 16 years Mr. Yerburgh has helped to counter the machinations of the Little Navy plotters, and of late years he realised the importance of aviation as a military and naval asset. It was at his instigation the scope of the Navy League was enlarged to embrace aviation and to promote its progress as a vital national necessity. His political career stands out with a clean sheet, and is one that might well serve as a pattern for a few of the job and salary hunters who regard their entry into Parliament as merely a means to the end of pulling the nation's leg to their own advantage. Mr. Yerburgh's generous personality will be much missed, especially amongst those for whom his endeavour was ever to provide a little healthful help and relaxation.

* * *

"Two aeroplanes made a forced descent near Newbury on December 8th. On one of the flying officers going to the local post office to telephone to headquarters to send a relief gang, he was told that he would have to wait, as the line was held up for the Newbury races!" A. G. W., who writes this little Christmas story, asks "Are we at war?" Perhaps we'll know presently, from Mr. Lloyd George.

* * *

"Combing-out" has set in in the R.N.V.R.A.A.C., and some people think none too soon. As a result, men over military age are required to fill the gaps left by those fit for general service abroad. Here's a chance for a lot of hefty youngsters of 45 and over who are anxious to do a bit in the war, to get into communication with the headquarters of the corps at 4, Whitehall Gardens, and find out what the conditions of service require.

* * *

Some quaint quandaries have arisen in all sorts of unexpected quarters from the lighting regulations in force in London and the country generally. Here is another almost Gilbertian situation which saw the light the other day during a case at Lambeth County Court when Judge Parry asked the Registrar (Mr. W. B. Pritchard): "Who is responsible for the lights if we sit after five o'clock? The Registrar says that the Judge is liable. I say that the Registrar is." Counsel quickly rose to the situation with the remark: "We shall be pleased to act for you as counsel at the police court, whoever is summoned."

* * *

A graceful and thoughtful action by King George is the conferring last week upon the three sisters of Earl Annesley, who succeeded his cousin (killed in action while in the Royal Flying Corps in 1914), the rank and title of an Earl's daughters, as if their father, the late Hon. William O. B. Annesley, had lived to become Earl Annesley.

* * *

We have the word of Lieut. C. Douglas, R.F.C., at a meeting of the Scottish Meteorological Society on Saturday, that the field of view from an aeroplane is so extensive that distant thunderstorms are easily discernible, he having "spotted" clouds 100 miles off from a height of 8,000 ft. Which gives point to a diagram published in "Flight" upon this subject not very many months back.

* * *

The Northampton Polytechnic has a very fine record in war work. At the recent prize-giving, Dr. R. Mullineux Walmsley, the principal, mentioned that 52 members of the staff, 185 members and 329 students had joined the Colours, of whom 90 had obtained commissions. In other unspecified ways the school has assisted in the manufacture of high-class munitions, whilst the equipment and staff of the Polytechnic have been placed at the disposal of the Government for experimental and scientific work. The Northampton establishment is a valuable national asset at all times, and has now proved its practical uses in War emergency as in Peace times.

* * *

An echo of the untimely death of Lord Lucas, whilst flying over the German lines, is to hand in the news that his observer at the time, Lieut. Lex Anderson, R.F.C., in some way not explained escaped death and is a prisoner with the enemy. Truly a case of the luck of war, for which his father, Professor Anderson, President of Galway University College, is duly grateful. *A propos* of the late Lord Lucas, a very human sketch of his life appears in the December issue of *T.P.'s Journal*, as well as some personal notes of interest touching upon the life of the late Sir Hiram Maxim.

* * *

Quite a goodly proportion of the officers in the last batch of British prisoners of war who have arrived at Berne from Germany are of the R.F.C. These are Lieut. John Firstbrook, R.F.C., Second Lieut. John Macfie, R.F.C., Second Lieut. Macaskie, R.F.C., and Second Lieut. Cuthbert Selby, R.F.C. They are fortunate to have got clear of German soil.

* * *

Levée en Masse.—The Crank: "Your Highness, I have here a scheme that will save many of your wonderful airships from destruction. It is a shell-proof envelope 6 ins. thick."

The Count: "Of what material?"

The Crank: "Iron, your Highness."

The Count: "Why, you idiot, how do you expect the airship to rise?"

The Crank: "It doesn't, your Highness. That is the sole purpose of my invention."—*Punch.*

TEN YEARS AGO.

Excerpts from the "Auto." ("Flight's" *precursor and sister Journal) of December,* 1906. "Flight" *was founded in* 1908.

The Bellamy Aeroplane.

In this country has arrived, with a suddenness which suggests the proverbial "bolt from the blue," Mons. Bellamy, whose ultimate object is nothing less than to make an attempt for the £10,000 prize offered by the *Daily Mail.*

The Bellamy aeroplane consists of a bamboo structure carrying a double-decked aeroplane at each end. In front each plane measures 10 metres by 2·75 metres, those at the rear are the same width, but only 7 metres long. Front and rear aeroplanes are situated 10 metres apart, and lying longitudinally between then are two triangular side-sails inclining upwards and outwards like the wings of a bird. Between the upper and lower aeroplanes at each end are vertical partitions, which give a cellular formation to the aeroplane as a whole. Projecting in front is a horizontal rudder, while behind, in the centre of the rear aeroplane, is a vertical tail. In this latter device, M. Bellamy states that he realises a fault, so that at present it is unnecessary to consider it too seriously as part and parcel of the apparatus. Power is developed by a 50 h.p. engine situated in the centre of the forward aeroplane, from which it is transmitted to tractor screws by chains. The aeronaut's seat is situated immediately behind the engine.

At the present time, M. Bellamy's claim for free flight is, we understand, a distance of 400 metres, so that there is still very much to be done before the Bellamy aeroplane can be regarded as having solved the problem of aerial navigation; the presence of the inventor in this country, however, is at least evidence that he himself looks upon his experiments as already progressing along very satisfactory lines.

answers to Correspondents.

If in doubt about anything aviatic, write to " Flight " *about it.*

L. L. (Coventry).

As regards weight, a wheel like that mentioned in your letter would, we should think, be a good proposition, but the authorities will not accept steel wheels, as these affect the compass. Some non-magnetic material, such as aluminium or phosphor bronze must be used.

B. A. C. (Shirley).

The particulars asked for in your letter are as follows :—125 h.p. Anzani engine : Weight 460 lbs., 1,200 r.p.m., fuel consumption about 9 gallons and oil consumption about 2·3 gallons per hour. 60 h.p. Beatty engine : Weight, 243 lbs., 1,600 r.p.m. ; fuel consumption, 4·28 gallons per hour. 150 h.p. Sunbeam : Weight, 610 lbs. ; petrol consumption, about 11 gallons per hour, and oil consumption about ½ gallon per hour ; speed, 2,000 r.p.m. engine, 1,000 r.p.m. propeller shaft. 100 h.p. Gnome : Weight, about 320 lbs. ; speed, 1,200 r.p.m. ; fuel consumption, 10 gallons per hour, and oil consumption 2 gallons per hour.

E. E. H. (Kettering).

The books " Aeroplane Design," by F. S. Barnwell, " The Design of Aeroplanes," by A. W. Judge, and " The Aeroplane," by A. Fage, all deal with " modern " practice, but do not give detail information concerning machines built during the war. Such information is not, as a matter of fact, allowed to be published during present conditions.

P. N. (Gt. Malvern).

We have not yet come across, except in our dreams, an " aerial outfit that will drive an ordinary bicycle from a rate ranging from a walk to 60 m.p.h., and do 100 miles to the gallon with a single cylinder engine of 4 h.p., driving a propeller of small diameter, but of high pitch, and which can also be used for a small boat at the rate of eight miles per hour, and for ice craft." Down a good long steep hill, with a following wind, or for preference a dive from the top of a cliff, the figures *might* be approached, but on the level—well, hardly.

G. C. B. (Broadstairs).

There is no book published at the present time giving the information and illustrations you desire.

A. C. (Tunbridge Wells).

You should write to the R.N.A.S. recruiting office, Brook Green, Hammersmith, giving full particulars. They would tell you if there are any vacancies.

Air-Mech. (R.N.A.S.).

Having obtained approval of your C.O., you should obtain the necessary form from Adastral House, E.C., and, having filled it up, send it forward through the usual channels.

W. G. N. (Norwich).

You should write to Major Mitchell, R.F.C., Regent's Street Polytechnic, London, W., giving full particulars of your experience.

T. M. S. (Peterborough).

Your experience should certainly help you. Write to the Secretary of the Admiralty for a copy of Regulations for the Special Entry of Officers into the R.N.A.S. That will give you all the information you require.

G. F. F. (Mill Hill).

We are afraid your defective eyesight would debar you from getting a commission in the R.F.C. Why not inquire at Adastral House ?

T. W. E. E. (Cardiff).

You should write to Adastral House, London. E.C. for the necessary form, and, having filled it up, send it to the Director-General of Military Aeronautics at the same address. You do not have to buy the commission.

A. V. W. (Thornton Heath).

1. There is no need to attest. 2. Send in your form as soon as possible. 3. We do not think so. 4. You should send copies unless the originals are asked for. 5. The salary can be made to cover ordinary requirements if care is taken.

N. W. (Newport).

We regret the Defence of the Realm Regulations preclude us from giving the details you desire. We believe the pay when training is 7*s.* 6*d.* a day. Kit allowance £50. See also " Flight " for November 9th, page 984, for rates of pay of R.F.C. officers.

S. H. I. (Tufnell Park).

You can hardly do better than study Burl's " Aero Engines," which can be obtained from " Flight " offices for 8*s.* 10*d.* post free.

E. J. E. H.

See reply to G. F. F. (Mill Hill).

W. M. (Robertsbridge).

The R.F.C. Cadets Battalion is for training officers for the R.F.C., and you can obtain full particulars from Adastral House, E.C. There is not a similar battalion connected with the R.N.A.S.

103661 R. E. (Oxford).

In the wireless installation on an aeroplane, the " earth " connection of the aerial is formed by a counterpoise or balancing capacity, which is obtained either by joining up all suitable metal parts of the machine, or by a system of wires entirely separate from the aerial. This " earth " should not be confused with those obtaining in other electrical circuits, such as the telephone, where the earth actually forms the return conductor of the circuit. The only connection formed between one aeroplane and another, or a land station, is by the radiating waves set up by the surging currents produced in the aerial. A series of very interesting and instructive articles on " Special Problems of Aircraft Wireless," by H. M. Dowsett, appeared in *The Wireless World*, commencing December, 1915, which you might find helpful.

Hack (Mare Street).

1,200 lbs. h.p. producing only 25 would hardly appear to be a business proposition—1,200 gs. h.p. would rather make it worse Facts, like money, are hard things to get away from.

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BRITISH AIR WORK.

The following typical items descriptive of the work done in the field by the Royal Flying Corps in France was issued by the Air Board on December 18th :—

" Bombing : Nov. 14th. Ten of our pilots carried out a series of successful raids by night. Stations and rolling-stock were attacked with bombs, two of which hit a moving train, bringing it to a standstill.

" Nov. 16th. Six of our machines bombed an enemy railway station. Six coaches were blown off the lines and two station buildings destroyed. Other rolling-stock was damaged.

" Nov. 21st. One of our machines (Capt. B. and Lieut. H.) from a height of 500 ft. dropped three bombs on some enemy lorries. The bombs having missed, the machine turned and flew over the lorries again and dropped three bombs in the middle of them. Turning again, our Observer turned his machine gun on the enemy from a height of 150 ft.

" Enemy Artillery losses : According to statements made by some prisoners of a German Artillery Regiment, large numbers of the enemy guns have been put out of action by direct hits, and they ascribed this to the accurate work of our air observation. Gun crews often had to retire and leave their guns for hours at a time."

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *General Headquarters, December 12th, 10.12 p.m.*

"Yesterday three enemy aeroplanes were accounted for, one of which fell inside our lines. One of our machines is missing."

War Office, December 13th.

"*Salonica.*—On the Struma front our aircraft reconnaissances continue."

Admiralty, December 15th.

"On the 14th inst. a squadron of naval aeroplanes carried out a bombardment of Kuleli-Burgas Bridge, south of Adrianople. A great weight of bombs was dropped and extensive damage is believed to have been done."

Admiralty, December 16th.

"On the 15th inst. an attack was carried out by a squadron of naval aeroplanes upon Razlovoi, 60 kiloms. (37½ miles) east of Ishtip, Serbia.

"A large number of bombs were dropped with effect, many hits being observed."

War Office, December 16th.

"*Mesopotamia.*—During the night of the 14th-15th our aeroplanes, flying by moonlight, successfully attacked the pontoon bridges on the Tigris, which the enemy had removed from their sites and was towing up-stream. The matériel was broken up and scattered."

War Office, December 18th.

"*Salonica.*—Our aeroplanes dropped bombs on Tumba Station and inflicted damage on some enemy transport on the Ghevgeli-Chernitsa Road."

French. *Paris, December 12th.*

"*Salonica.*—One enemy aeroplane was brought down on the Struma front. Our air service bombarded the enemy cantonments in the region of Doiran and the Vardar Valley."

Paris, December 13th.

"*Salonica.*—A German aeroplane was destroyed by the fire of our artillery near Bouvaucourt.

"An enemy aeroplane, compelled to come down, was captured by an Italian detachment. The two officers manning the machine were taken prisoners."

Paris, December 15th.

"In spite of the unfavourable weather, the air service played a brilliant part in the fighting [at Verdun]."

"*Salonica.*—The Allied air service displayed great activity. One enemy machine was brought down south of Petrik."

Russian. *Petrograd, December 14th.*

"Our aeroplanes successfully dropped bombs on the Plouiov Station on the Tarnopol-Zolotchev Railway, and on a transport near the village Nouchtche, which is north-east of this railway."

Petrograd, December 15th.

"Yesterday our aeroplanes fought three aerial actions in the region of Zalovce, Luchce, and Mlynovce, and on each occasion drove back the enemy to his own lines."

Petrograd, December 16th.

"In the Black Sea, in order to destroy the flour mills which are supplying the Bulgarian Army, our warships on December 13th successfully bombarded the port of Baltchik. They were unsuccessfully bombarded by the enemy's shore batteries and attacked by his hydroplanes and submarines."

Petrograd, December 18th.

"In the Boldury region an enemy captive balloon was carried by the wind behind our positions. We are without information as to its descent."

Italian. *Rome, December 13th.*

"On the Carso one of our aeroplanes attacked an enemy kite balloon, which fell in flames near Ternovizza (Ternwica), north-east of Nabresina."

Serbian. *Salonica, December 15th.*

"Yesterday was also marked by great aerial activity on both sides."

Salonica, December 16th.

"Yesterday (December 15th) there was artillery fire on both sides without any infantry action, and great aeronautic activity."

German. *Berlin, December 18th.*

"Enemy columns retreating to Braila were attacked with visible effect by our air squadrons."

Austrian. *Vienna, December 14th.*

"Austro-Hungarian airmen shot down an enemy battle aeroplane over Commanesci. The machine turned upside down and crashed into a wood."

Bulgarian. *Sofia, December 12th.*

"Hostile aerial activity at Porto Lagos was without result."

Sofia, December 14th.

"There was lively activity on the part of enemy airmen over our positions and in our rear. Several of our aeroplanes successfully dropped bombs on the British bivouacs and depôts near Tchaizaza."

Turkish. *Constantinople, December 18th.*

"We destroyed the enemy aeroplane which had been brought down by our fire, as announced in our yesterday's *communiqué*."

AIR WORK IN MESOPOTAMIA.

The following pen-picture of the work of our flying officers in Mesopotamia was sent by Mr. Edmund Candler from Aral Village, Mesopotamia, on October 28th :—

"Up in the air one loses the mirage. Immediately you leave the ground things cease to be blurred. The dancing images and amorphous shapes of a level horizon become infantry, or sheep, or camels. The eye in the air is nowhere so essential as in the desert, where all objects conspire in illusion.

"I heard a subaltern observer describing an action early in the campaign when he was in the only machine available at that particular time and place, and he had no wireless. The whole thing seemed so simple and easy from his perch in the air. He could see our own cavalry and the enemy's approaching each other in the haze, neither having any idea of the other's existence. He felt that he could turn the tide of battle, or rather turn an inconclusive engagement into a big *coup*, if only he could make himself heard. But down below everything was obscured in mirage, and so we may have missed a chance.

"But that was in an early phase of the show. We have had time to make good in the air since then in man-power, machine-power, staff, and material.

"Our ascendancy in the air is as complete here as in France. The closest touch has been established between artillery commanders and pilots and observers, with damaging effect to the enemy's guns. Air photography, as a means of charting a hostile and unsurveyed country, has been brought to a scientific finish. Hangars have reduced the wastage of our machines, which in the earlier days warped and shrank in the alternate rain and sun. By constant bombing raids, especially at night, we have established an aggressive offensive. The result of fights in the air has been that a week often passes without a sight of a hostile aeroplane.

"Low flying, no easy thing in the dark, has become the rule of late. In a raid at Shumran the other night one of our machines was hit by spinters, from its own bomb. The effective machine-gun fire near the ground, in co-operation with our cavalry, has been the most remarkable development in the air. Our aeroplanes have become the terror of thieves, raiders, and irregular horse. It is impossible for them to get off with their loot in the morning. No nullahs are deep enough to hide them. Our machines, flying a few feet above ground, scour the whole desert, rake their hiding-places with machine-gun fire, scatter and pursue their cavalry, spreading panic among their horses, and round up the retiring convoys, while our cavalry follow up and bring back the spoil. Such was the result of an attempt to raid our camel transport at Sheikh Saad. Of course, an action of the kind would be impossible over the enemy's position, but on the line of communications it is most effective. Our flying men have discovered a short way with raiders.

"A country where the elements are so perverse as they are in Mesopotamia must have its air disabilities. At different altitudes you meet currents blowing in contrary directions, and the change as you pass from one into the other makes very bumpy flying. This is an accentuation of the atmospheric conditions which at one time were referred to as 'air-pockets,' the popular idea being that the machine suddenly found itself in a void through which it fell, having no supporting envelope until it reached normal atmosphere again.

"Though the wind currents over the desert are eccentric, the *Shamal,* or north wind, blows at some level or other all through the year. If it is not blowing on the ground you will strike it in your machine if you go high enough. Sometimes the air is calm at the ground level, while there is a gale blowing at 5,000 feet. Or you may ascend in a gale, which increases in violence until you have passed an altitude of 6,000 feet, when you strike an atmosphere where it is perfectly smooth going. In the hot weather, conditions for flying are very trying. At night and in the early morning the air at 500 feet is far hotter than on the ground, and it becomes hotter and hotter until you reach 3,500 feet. You must make 6,000 feet before you begin to feel cool. The intense heat thins the oil; you can never run your engine full out or she will get red hot. You lose 20 horse-power at a temperature of 115 degrees. Long flights are impossible. After 9 a.m. the heat makes conditions most adverse for flying, and there is nothing doing in the evening. The wood warps and shrinks in the sun. New machines have to be rerigged when they come out, and the dust chokes the engines. The sand rises in clouds and blows as high as 4,000 feet.

"During the last rainy season mud sometimes put our machines out of action. After a single day's rain at Oran a 90 horse-power engine and eight men could not move an aeroplane in the driest part of the aerodrome in the driest part of the camp. Then there are the floods. An aeroplane at Kurnah or Nasiriyeh, between April and July, has the same difficulty in finding a dry spot as Noah's dove. And it is much easier to land than to get away. At the beginning of the campaign, when we were operating in country where the tribesmen were in the pay of the Turks, the landing difficulty increased the odds against our airmen. An aviator going up to Nasiriyeh in July, 1915, had to land in an inundated area. He was able to bring his machine down in the flooded water on the friendly side of the river. He escaped with his revolver and rations as the Arabs on the other bank made for the machine, but friendly Arabs opened fire on them and scattered them, and the aeroplane was recovered intact. During the return from Nasiriyeh, two machines came to ground, one alighting near Khamisiyeh. It was just after the defeat of the Turks, and a responsible Shaikh received the pilot and entertained him hospitably. The other machine came down the same day within 15 miles, but it fell amongst defeated and retreating auxiliaries, who were in no mood to give quarter. Both pilot and observer were killed.

"Now we are having things very much our own way, though the enemy have brought out some good machines, fine fliers, and gallant men. Their two Fokkers disappeared after a fight with our airmen on August 13th, and have not been seen since. One landed well within the Turkish lines; the other on rough ground by the Tigris bank, where it was broken up by our gun fire. Since this our machines have carried out their work unmolested. One of our pilots made a great sensation in the Turkish camp the other day when he looped the loop and cartwheeled over Kut in contempt of their Archibalds. Prisoners tell us that this derisive little bit of bravado impressed our friends immensely.

"Chaff is exchanged freely between the rival Flying Corps. Many of the enemy pilots are Germans, but even the Hun can become a gentleman in the air. His nature seems to improve with the element he frequents. Most gross on earth, less gross at sea, least gross in the clouds.

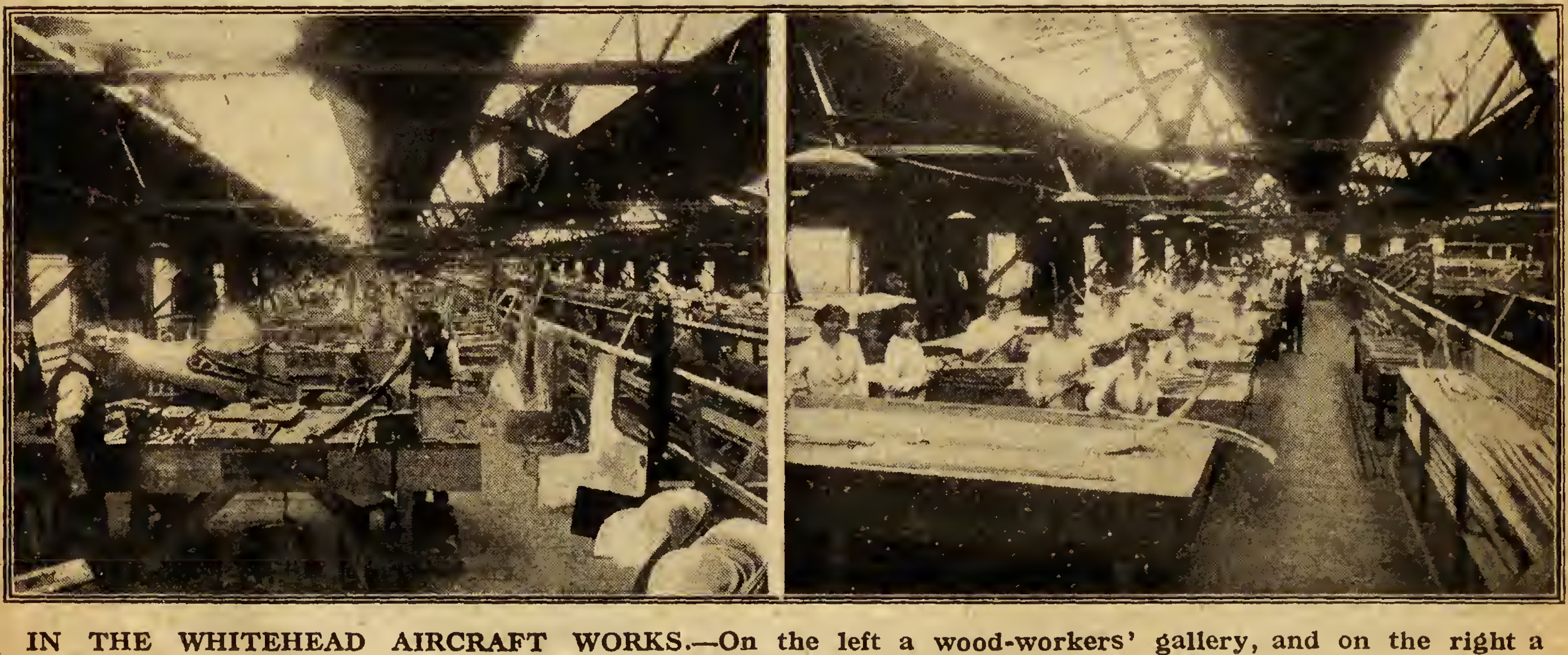
"Apparently, altitude purges and refines, or it may be that the finished clod does not take to the air in the beginning. A 100-lb. bomb, or a drum of machine-gun bullets are a better currency than chaff, but our air scrapping is none the less formidable for the high spirits in which the Flying Corps goes into action. Smith inquiries of Schultz: 'Why don't you use the aeroplane we left you at Kut? Can drop you spare parts if they are any use.' It was a mere shell of a machine, and information had come through that they were trying to put a German engine in it. 'Go on dropping bombs on our aeroplane,' Schultz retorts; 'it is from 800 to 900 metres high, and you haven't done any damage yet. By the way, we have a machine that will strafe you, born of an English mother by a German father (engine), an improved 1916 type.' Hence its barbarous hum (*barbarische Hummen*). The English illustrated papers, when they contain anything which may penetrate the Hun epidermis, are dropped on their aeroplanes. *Simplicissimus* and *Jugend* rain upon ours."

Air Work in the Verdun Push.

Writing from Verdun on December 15th as an eyewitness of the Verdun battle, Mr. G. H. Perris in his despatch to the *Daily Telegraph* makes the following reference to the work of aircraft:—

"Heavy purple clouds filled the sky, but only a few scurries of rain and sleet fell during the day, and the dark hillsides rising toward the central crest of Douaumont remained clear of mist. This was an important advantage, for the French aviators were able to carry on without cessation their valuable work. Despite a strong and icy wind, the great biplanes and the little Nieuports came and went, while a dozen sausages held permanent guard at the end of their long cables. There must have been some German planes near the front, but I did not see one on our side of the lines, and I only saw one German observation balloon, and that was falling like a huge torch beyond Douaumont, an incident typical of the enemy's day.

"Everywhere the sky is splashed with the rising and falling flames of signal rockets, and in every part of the front intrepid airmen swim in and out of the zone of death."



IN THE WHITEHEAD AIRCRAFT WORKS.—On the left a wood-workers' gallery, and on the right a shop showing some of the women workers.

SIDE-WINDS.

THE thick fog which settled on London on Saturday last rather upset the calculations of many who had anticipated having a good time at the Annual Works Christmas Dinner of Handley Page, Ltd., which took place at the Holborn Restaurant. As a matter of fact, Mr. Handley Page himself was a victim, but arrived only a quarter of an hour late, and relieved Mr. Theodore Page, who had meantime most ably deputised in the Chair. Among the 250 to 300 employees and their friends who were present, there was a goodly muster of the women workers, and Mr. Handley Page, in his reply to the toast of "Success to the old Firm," proposed by Mr. H. Whitmee, emphasised the splendid work which the women were doing by way of helping to win the war. He also mentioned that, although the firm's machines had secured several world's records in the way of passenger-carrying, &c., they were by no means content with their achievements, and had even better things up their sleeve. Speeches were commendably few, but an excellent musical entertainment had been arranged, and fortunately only two artistes were reported missing.

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IN one way the fog was a friend to those who went to the dance of the Wells Aviation Swimming Club at the Chelsea Town Hall on Saturday, for if every one who intended to had turned up, there would have been no room for dancing. Although it was only started this year, the Club—thanks to the generous support of the firm and the enthusiastic work of the Swimming Captain, Mr. Guy W. Davis, and the Hon. Secretary, Mr. Frank Blakey—has had a most successful season, and Mr. Wells, the President, was confronted by a fine array of prizes to distribute. Among them was a fine challenge shield, presented by the firm, for an inter-departmental competition, and this year the Staff hold it. The Club has a promising ladies' section, but all the contests arranged for the past season fell through for lack of support. As the section includes a Chelsea champion, however, it is hoped that at the next annual dance the fair sex will be numbered among the prize-winners. There were many striking and effective costumes at the dance, but, strangely enough, aviation had not inspired any of them, with the possible exception of the lady who took the first prize for "Shavings," and who had cleverly utilised the waste of the rib shop for decorative purposes. The judges for the fancy dresses were Mr. Wells, Mr. Doyle Jones and Mr. Walter Jones. Unfortunately Mr. Wheatley, the new works manager, was unable to be present.

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WOOD screens are quite useful in their way, but they are not much good if it's wood-screws, whether they be brass or iron, you want. So it should be noted that it was wood-screws, both brass and iron, which Messrs. Whiteman and Moss, Ltd., of 15, Bateman Street, Dean Street, W., were offering last week in their advertisement. The screen part of the wording was only the compositor's version of the goods available for constructors.

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A BURBERRY waterproof garment is a thing to be desired, and many, whose only opportunity to achieve their ambition in this direction is at the Burberry half-price sale, will be relieved to hear that this annual event will be held as usual. It opens on January 1st at their showrooms in the Haymarket. By copious dilution of their several staffs with female substitutes and vigorous recruitment of skilled men, too old or otherwise exempt from military service, Messrs. Burberry have been able to carry on, and to offer at the coming sale a great array of very attractive bargains in waterproof topcoats, gowns, hats and suits. The quality of Burberry cloths and garments is testified to by their earned reputation, but it is obvious that if, in wearing and protective properties, they can emerge successfully, as they have, from the strenuous test of 30 months' war in all climates, they are more than efficient enough for the ordinary experiences of every-day open-air life in this country, severe as that may be. In addition to weatherproof overcoats of Burberry's many exclusive designs and materials, there are a large number of gowns and completed suits, models which are still the height of fashion and likely to remain so. These are available in exhaustive varieties of texture, weight, colour and patterns, which are uniformly beautiful and artistic. A limited number of military service jackets, slacks, breeches and short-warms are also included in the sale. Much of the stock is to be sold at one-half—and in some cases at less than one-half—current prices, and other portions are marked down to the very lowest figures that the cost of production justifies. A post-card to Burberry's, Haymarket, London, S.W., asking for sale list, will receive immediate attention, and an early visit of inspection is cordially invited.

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THE Rotax Motor Co. advise us that Mr. C. Benson, lately Works Manager of the Arrol-Johnston Co., has left that firm and has joined up as Works Manager of the Rotax Co., from December 1st. The increasing scope of the important work being undertaken by the Rotax Co. is the reason for this change. Mr. Benstead, until lately Works Manager of the Rotax Co., will devote himself entirely to the electrical side of the business.

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THE Rotax Co. are fortunate in being able to obtain the services of Mr. Benson, whose workshop experience is a very extensive one, for he has put in terms with large engineering firms both in the States and in Germany, in addition to his extensive experience in this country, which comprises such firms as Messrs. A. Herbert, Ltd., David Brown and Sons, Humber, Ltd., in addition to the Arrol-Johnston Co.

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IN accordance with the official announcement made by the Ministry of Munitions regarding the Christmas holidays, the offices and works of Messrs. C. A. Vandervell and Co., Ltd., of Warple Way, Acton Vale, W., will be closed from Friday evening, December 22nd, until Thursday morning, December 28th. The above is subject to any change which the Ministry of Munitions may announce.

* * *

FROM THE BRITISH FLYING GROUNDS.

Grahame-White School, Hendon.

STRAIGHTS with Instructors last week: Messrs. Child, Pearman, Scudamore and Shaver. Circuits with Instructors: Mr. Fielding. Circuits alone: Messrs. Balden, Coltman, Flynn, Green, Nightingale, Robertson, Shaw and Travers. Instructors: Messrs. Winter, Pashley, Biard, Hale, Fitzsimons and Meering.

* * *

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EDITORIAL COMMENT.

The Passing of 1916.

YET another year is about to pass into the realm of the things that have been, and we can truly say that it will pass with rather less of regret than we usually view the passing of the milestones of Time. It has been a year of stress and of much disappointment on the whole, though it has had the redeeming feature that its last month has seen the substitution of a live for a moribund administration of our national affairs. It has been a momentous year in many ways, as well in the development of aviation as in the affairs of the world generally. Of the former it is still impossible to speak in detail, since the considerations still obtain that have precluded detailed comment on aircraft progress for the past two years. Last year the word "Peace" was probably the one that was farthest away from our thoughts. Now it is in everyone's mind. Not that there appears to be even the remotest chance of a world-peace within any period of time to which a name can be given now, but the word has been uttered and in no uncertain manner. We know that the word and the manner are alike unacceptable at the moment, but the mere fact that it has been uttered and that we know at least some of the conditions that have prompted it, has led to the realisation that the war *must* end sometime, and to the hope that that end is now not far off.

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The British Air Services.

During the year both branches of the British air service have developed wonderfully, alike in material and in the numbers and efficiency of their *personnel.* There have been no changes in the higher commands of either Service, nor have there been any such dramatic "reorganisations" to chronicle as fell to be recorded at the end of 1915. The story of development has been one of steady improvement all round rather than of drastic change.

In Parliament and in the Press we have had a great deal of discussion of aerial policy generally, the necessity for which can only be regarded as a regrettable outcome of the lack of single-mindedness of the late Administration. A Committee of Enquiry early in the year was charged with the washing of a great deal of dirty linen that might better have been cleansed privately and without recourse to methods which could not have failed to afford satisfaction to the enemy and uneasiness among our Allies. Then the numberless questions and discussions which arose out of the "Wait and See" policy must have accentuated those feelings, which the ultimate appointment of an Air Board, with Lord Curzon as its President, could have done very little to allay. At the time of its appointment it was understood that this Board was to have executive functions. Later, it transpired that this was not the case, and at once the whole controversy about the air services was revived in an acute form. The subject was to have been one for a full-dress debate in the House, when the change of Government intervened, and, like other matters of public interest, it had to be shelved. To the intense satisfaction of all who have made the study of aerial policy their own, one of the first official announcements of the new Ministry was to the effect that we are to have a real Air Board with executive functions, and a Parliamentary Secretary to speak for it in the House. A Bill to give effect to the announcement is shortly to be introduced. Quite as satisfactory was the statement that the friction between the Air Board and the Admiralty, which militated against the usefulness of the former, has been smoothed away, and that now all are working to the common end. In this we see strong hope that the days of "Air Crises" are over for all time.

The past year has seen the election to Parliament of the first Member to be sent to Westminster on the issue of an aerial policy. Mr. Pemberton Billing had a great chance had he chosen to avail himself of it. Perhaps the best—as it is certainly the most charitable—comment that can be made is that he failed to see the Heaven-sent opportunity that was given him to make a real and lasting mark in public life.

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New Aircraft Types.

Now, as a year ago, it is impossible to speak except in the most general terms of the developments which have been brought about by experience gained during another twelve months of war. In the realm of the heavier-than-air machine the tendency has been to develop the large, fast battle-plane and the speedy scout. Power and speed in both types has increased greatly during the year, both on our own and the enemy's side. It has been a fight for greater efficiency on both sides, with the pendulum alternately swinging this way and that. It is satisfactory to be able to record that the end of the year sees our Army equipped with machines that are fully equal to, if not better than, the best the enemy can put into the air. We should be still more pleased if we were satisfied that our Flying Service has these "best" machines in sufficient numbers.

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The Dirigible.

Although it is undoubted that much has been learnt about the construction and use of airships during the year under review, it is not possible to say that the development of the lighter-than-air craft has shown the same advance as in the case of its heavier sister. We know that many improvements in construction have been effected, but so far as these affect the airship fleets of ourselves and our Allies, again nothing can be said for the most obvious of reasons. The enemy has busied himself on the building of much larger and greatly improved airships of the Zeppelin type, from which great things were hoped. His initial experiences with these super-Zeppelins have not been such as to encourage him to persist with the type in the purpose for which they were intended—the raiding of these shores—as we shall see when we come to review the narrative of the year's air raids. These experiences have probably taught the German air command that the game is not worth the candle. It would, however, be foolish to think that because the manner of dealing with the raiding airship has been discovered that the type is useless for purposes of war. On the contrary, it has shown itself to be an essential part of aerial equipment for war, and that notwithstanding the disasters that have overtaken many lighter-than-air craft engaged in warlike operations during the year. That an effective answer has been found to the airship when used to raid hostile territories does not of necessity demonstrate that it is a totally ineffective arm, but simply that its undoubtedly great capabilities can be better utilised in another and less risky direction. Over and above its potentialities for war, the dirigible, in the form to which belligerent experience will be found to have developed it, has a great commercial future before it. It will be well, therefore, if we do not allow our vision to be clouded by the happenings of the past twelve months, and that we should pay close attention to the future of the airship.

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Raids—Enemy and Allied.

During the year the enemy has again made a number of aerial raids on these shores, both by airship and aeroplane. So much have our defences been improved that we can almost regard the tale of enemy raids with something approaching satisfaction. Early in the year a raiding Zeppelin was brought down in the Thames Estuary, and every effort was made to salve it. A little later another similar craft was seen in the North Sea, partially submerged, by the crew of the British trawler "King Stephen." The crew of the wrecked airship begged to be taken off, but the master of the trawler, guided by known Hunnish methods, declined to take the risk involved and left them to their fate. There was a good deal of discussion relative to the conduct of the master, but he was held by most people to have acted quite properly in refusing to trust his vessel and her company to the faith of the armed airship crew. In September the first raid on London of the year took place, in which inconsiderable damage was done, while Lieut. Robinson, of the R.F.C., brought down an airship at Cuffley, for which he was awarded the V.C. Another raid on the Metropolis took place a month later, and this time the enemy was still more unfortunate, as he lost two of his latest super-Zeppelins, which were brought down—one at Billericay and the other near the Essex coast. One consequence of this raid—a particularly unwelcome one to the enemy—is that the fullest details of construction of the latest Zeppelins are no longer a secret to our own services. One more attempt was made on London in October, resulting again in disaster to an enemy airship, which was brought down in flames at Potter's Bar.

In November a fleet of hostile airships raided the North-Eastern and Midland counties, again with disastrous results to the raiders. One enemy airship was brought down by gunfire and aeroplane attack off the coat of Durham; the other was destroyed nine miles off the Norfolk coast. Of this brace, one fell to the R.F.C. and one to the R.N.A.S. In addition to this large scale raid, during the same week a hostile aeroplane dropped six bombs in the West End of London shortly before noon, but without doing any material damage worth noting. The enemy pilot was brought down and captured by French machines near Dunkirk while on his return journey.

IN WINTER'S GRIP BEHIND THE LINES.—Our Army's eyes, ever watchful above, whatever the weather.

At the outset of the Roumanian campaign the enemy carried out many air raids against Bucharest, in which aerial "frightfulness" was seen at its worst. Not content with dropping the usual explosive and incendiary bombs and killing and maiming many of the civilian population, it is categorically stated that poisoned sweets and disease germs were showered on the Roumanian capital.

In respect of the enemy's Zeppelin losses during the year, it appears to be fairly well established that these amount to 39 in all, in addition to which other losses are said to have been incurred, but have not been sufficiently authenticated.

All the raiding by air has by no means been left to the enemy. On the contrary, a number of notable raids have been undertaken by the Allied air services with a considerable measure of success. Zeebrugge has been attacked by numbers of R.N.A.S. machines on several occasions, and a great deal of important damage done to the military works and the shipping in the harbour. Enemy munition works and blast furnaces have been successfully bombed by combined British and French squadrons, while in the Eastern theatre R.N.A.S. machines have done excellent work against Bulgarian harbours and communications.

The most notable flight of the year was that accomplished by Lieut. Marechal, a French pilot, who flew from Eastern France across Germany, dropping leaflets in Berlin, and landing by mistake in the Austrian lines in Poland after a flight of over 800 miles. Another notable raid was that made by two French airmen on Krupps' works at Essen, involving a flight of more than 500 miles, both machines returning safely. Later one of the Essen raiders, Capt. Beauchamp, flew from France into Italy, dropping bombs on Munich and crossing the Alps on his journey. Unfortunately this gallant officer met his death in December while flying at Verdun.

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The Roll of Honour. Unfortunately the enormous increase in the Air Services has carried with it a correspondingly heavy toll of loss, though it is satisfactory to be able to temper the reflection with the knowledge that in proportion to the amount of flying done our casualties have been relatively lighter than in 1915. Even so, we have to mourn the loss of a very large number of gallant pilots and observers who have laid down their lives in the great effort to free Europe of the German menace. In spite of the heavy losses there is no dearth of candidates to fill the depleted ranks. In fact, there are more applicants for admission to the Flying Services than ever.

Where so many gallant officers have sacrificed their lives on the altar of duty, it seems invidious to select from the roll of fallen any for special mention. A passing reference, however, may be made to Lord Lucas, whose death while flying in France was officially reported in November. An ex-Cabinet Minister, of over 40, Lord Lucas had previously served in the South African War, in which he lost a leg. In spite of this disability, when he went out of office on the formation of the late Coalition Government he immediately joined the R.F.C. and went to France. Two other notable personalities who were killed in England while engaged in an experimental flight, were Commander Usborne and Lieut.-Commander Ireland, two of the best of the R.N.A.S. pilots.

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The Royal Aero Club. Again it falls to be recorded that although the Royal Aero Club has still had to hide its light under a bushel, so far as public activities are concerned, it has, nevertheless, accomplished a great deal of very useful work during the year.

The Flying Services Fund, which was founded in 1915 for the purpose of assisting the dependents of members of the Flying Services killed in action or disabled by wounds, has reached the substantial total of nearly £12,000. Although this may be regarded as passably satisfactory, in view of the great increase in the Services and the correspondingly heavy number of those needing relief, it is to be much hoped that during the coming year the industry and others interested in the aerial movement will come forward with even more generosity than in 1916. The total should be nearer £120,000 than the modest £12,000. As the year closes the Club is moving into new and more commodious quarters in Clifford Street, though these will not be available to the members until early in the new year. With this departure, the successful future of this ruling body in the Aeronautical World should be more than ever assured.

The Report of the Air Enquiry Committee. It is fitting that the close of the year and the appointment of a new Administration should be coincident with the issue of the final Report of the Committee of Enquiry into the command and administration of the R.F.C. The Committee's recommendations were published in last week's issue of "Flight." As for the Report in its entirety, it is of too lengthy a character for even careful review at the moment. That, however, is scarcely a matter of moment, since the points of criticism have been covered in the main by the Committee itself in its Recommendations.

There are, nevertheless, one or two points of the Report to which reference may usefully be made. Leaving over for the moment the Committee's findings on what may be described as general charges, and confining our attention to the specific, we find that the Committee is to some extent in agreement with the statement that pilots and observers have been sent to the Front before they were sufficiently trained. This, in the view of the Committee, was inevitable in the early stages of the war, and no blame attaches to the Command for the inevitable situation in which the R.F.C. found itself on the outbreak of war. Strenuous efforts have been made to cope with the difficulties, but even now training is to some extent hampered by the want of sufficient school machines and of instructors. The Committee favours the rapid development of special aerodromes for instruction of pilots and observers in air-fighting.

The Committee and the R.A.F. So far as concerns the allegations that undue preference was given to the R.A.F., and that there was grave delay in ordering engines from private firms while the Factory was getting out designs, the Committee finds that the alleged delay in ordering better engines occurred in respect of the 110 h.p. Clerget, the 110 h.p. Le Rhone, and the 200 h.p. Hispano-Suiza engines. All these engines are admittedly good, and all have now been ordered in considerable quantities. There was no undue delay in ordering the 110 h.p. Clerget engine. There was very considerable delay in the case of the 110 h.p. Le Rhone engine, and slight delay in the case of the 200 h.p. Hispano-Suiza. As to aeroplanes, they think there was no delay for which any blame can be attributed to the Royal Flying Corps. They do not believe that the delay in ordering the Le Rhone and the Hispano-Suiza engines was attributable to the fact that the directorate was trusting to the Royal Aircraft Factory to produce equivalent or better engines. As to whether any blame attaches to the directorate, the Committee think the delay in ordering the Le Rhone engine was too long, but they are satisfied that, within the limits of the engines actually available, no undue preference has been given to the Royal Aircraft Factory.

It was said that the feeling of the trade against the Royal Aircraft Factory was bitter, but as to this the Committee had no evidence from trade witnesses. Some of the witnesses went so far as to say that the Factory was a competitive manufacturer with private firms. This was so contrary to the fact that the Committee dismiss the suggestion as frivolous. The Factory has built no engine except experimentally, and has only constructed for use 77 aeroplanes, of which 50 were to assist a private maker in the fulfilment of an order.

It was alleged that the Royal Aircraft Factory had been a dis-service and not a service to the Royal Flying Corps. The first branch of this criticism amounts to the charge that the designs of the Factory, whether of aeroplanes or engines, have not been efficient. As to this they assert that the Factory has produced many designs which have done admittedly good service, but it must be judged by its principal achievement, the B.E. 2c aeroplane, combined with the 90 h.p. R.A.F. engine. Much of the criticism of this machine has been ill-founded. All the three airships which were brought down in flames on the nights of September 2nd, September 23rd and October 1st last were brought down by pilots flying B.E. 2c machines fitted with R.A.F. engines.

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Loss of Air Supremacy. This charge, the Committee remarks, relates to the period of some six months beginning in about October, 1915. Reports from the Front are singularly diverse as to the extent to which superiority was for a time lost. In some places the German superiority for a time seemed marked, in others it was non-existent. Such local inferiority as there was seems to have been chiefly due to our tardy recognition of the change brought about by the Fokker, but the Committee think that, although we had at the Front at all times machines capable of dealing with the Fokker on at least equal terms, these machines were not at first available in sufficient numbers. Our temporary loss of superiority has been described in language of such gross exaggeration as to make the Committee at first disposed to think there was nothing in it; but a careful examination of all the facts leads them to the conclusion that the charge is true to a limited extent. Our newer aeroplanes, which are now coming forward in greater numbers, are proving individually superior to those of the Germans; and, while there must be casualties where there is fighting, our early superiority has been more than regained.

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Zeppelins should be Raided in their Lairs. On the suggestions that the best defence against air raids on this country is to attack the enemy's craft in their bases, the Committee thinks the principle is sound, and does not doubt that it has been carefully considered by the proper authority. As the Committee very properly remarks, the decision as to whether machines should be used for the purpose does not rest with the R.F.C., who can only act at the Front under the orders of the Commander-in-Chief of the Army, and regard must doubtless be had to the demand for aeroplanes for other purposes. We do not appreciate that the suggestion under review was made in the form of a charge against the R.F.C. It is essentially a matter for the Higher Command, and where there was criticism of the failure to carry out long-distance raids on enemy aircraft bases, it was against the authority charged with defence as a whole that it was levelled, and not specifically against the R.F.C. There is, it must be said, a good deal in the argument that the great advance of the German Army into France and Belgium has had the effect of making the journey to many of the Zeppelin bases longer than was anticipated. That, however, does not dispose of the failure to carry out an important number of raids on the nearer bases.

On the whole the Committee has given us a very fair summing up of the evidence, and its conclusions must be admitted to be thoroughly sound on the weight of evidence submitted to it. As we purpose publishing the Report in full, including the additional valuable recommendations by Mr. Charles Bright, in the pages of "Flight," following up the Committee's recommendations, which we published in last week's issue, our readers who are interested will be able to judge of that for themselves.

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The Life of the AirBoard. In reply to Colonel Ashley, the Home Secretary on Wednesday last week confirmed the statement that the intention was that the life of the Air Board should be for the period of the war and for twelve months after. In the course of the year after the war there would be ample time to consider whether the Board should be continued as a permanent institution!

This, on the face of things, appears to us to be an extraordinary view to be taken, in the light of all that has gone before. Unpreparedness due to an inability of the lay mind to appreciate what was implied in the conquest of the air characterised our condition at the outbreak of war. Concentration of aerial affairs in the hands of those who knew next to nothing about aerial affairs caused us to lag behind the enemy until it was almost too late to recover ourselves. Then came the tardy recognition—which turned out to be only half-recognition after all—that aerial preparation for war was the work of experts, and we had the Air Committee. That failed for the same reasons that had caused failure before—the lay mind was unable to grasp the fundamental fact that, in order to succeed, the people who *know* must be given a free hand. Next came the Air Board fiasco, which again failed because of the continued refusal of the Government to entrust the work of putting our aerial equipment on a proper basis to the very people it had appointed because they knew their business.

When we were told that an Air Ministry was to be constituted we welcomed the news, because we believed that at last things were to be put on a sound and permanent footing. Now, it seems to emerge that at the end of the war we are to relapse into the old half-hearted way of doing things. The Air Board, in a word, is to be merely a stop-gap affair again, a mere go-between to transact the buying of supplies for the period of the war and to clean up its house before vacating it afterwards. Can no one in authority realise that in the future aerial supremacy is going to mean all that the command of the sea means to us now? Have all the lessons of the war that have been learnt in the air been forgotten already, that we are calmly told in so many words that at the end of the war we shall begin to consider if it is worth while to continue an Air Ministry? Does our Government think that the Germans will be content to let things slide in the same way, supposing that we do not fully succeed in imposing all our own terms on them? And even should the issues of the war turn out to be all that we desire, is there no possibility that another Power may arise desirous of challenging our supremacy? We do not like it at all. We had expected better things of the new Administration, and we trust that later on it may be explained that this statement to which we take the strongest possible exception does not mean what it apparently does.

THE ROLL OF HONOUR.

Reported by the War Office:—

Killed.

8839 2nd Air-Mech. D. Buckley, R.F.C., attd. R.G.A.
2073 1st Air-Mech. O. F. Watts, R.F.C.

Previously reported Missing, now reported Killed.

Lieut. E. G. A. Bowen, R.G.A., attd. R.F.C.
2nd Lieut. S. Dendrino, R.F.C.
2nd Lieut. G. Edwards, R.F.C.
2nd Lieut. O. C. Godfrey, R.F.C.
Capt. C. J. Hart, Worcester R. and R.F.C.
Lieut. J. M. J. Kenny, A.S.C., attd. R.F.C.

Died of Wounds.

41060 2nd Air-Mech. J. W. Chiverton, R.F.C.
15557 2nd Air-Mech. E. Lovesey, R.F.C.

Wounded.

2nd Lieut. J. A. Ainscow, R. Warwick, attd. R.F.C.
Lieut. J. P. Greenwood, A.S.C., attd. R.F.C.
2nd Lieut. T. Thomson, Argyll and Suth. H., attd. R.F.C.
4174 Sergt. S. W. Birch, R.F.C.
524 Sergt. F. E. Darvell, R.F.C.
22838 2nd Air-Mech. S. A. Gough, R.F.C.
12325 2nd Air-Mech. H. Naphtale, R.F.C., attd. R.G.A.

Wounded—Shock, Shell.

16859 2nd Air-Mech. D. North, R.F.C.

Missing.

Lieut. B. P. G. Hunt, Yeomanry and R.F.C.

Previously reported Missing, now reported Prisoners of War in German hands.

Lieut. A. H. M. Copeland, Can. A.S.C., attd. R.F.C.
Lieut. I. M. Johns, Welsh R. and R.F.C.
2nd Lieut. W. E. Knowlden, Border and R.F.C.

Honours for Mesopotamia Flying.

A supplement to the *London Gazette* issued on Dec. 22nd announced the following honours for services rendered in connection with the military operations in Mesopotamia. They date from June 3rd:—

D.S.O.

Capt. (Temp. Major) P. W. L. Broke-Smith, R.E. and R.F.C.
Capt. H. A. Petre, M.C., Australian F.C.

M.C,

Lieut. (Temp. Capt.) J. R. McCrindle, Gord. Hs. and R.F.C.

More Military Medals for R.F.C.

In a *London Gazette* supplement published on December 21st it was announced that His Majesty the King has been graciously pleased to award the Military Medal for bravery in the field to the undermentioned:—

7258 Corpl. (Actg.-Sergt.) H. Brown, R.F.C.
7748 1st Air Mech. W. H. Dowling, R.F.C.
10591 Corpl. C. T. Galpin, R.F.C.
4917 1st Air Mec. F. S. Macknell, R.F.C.
8847 2nd Air Mech. J C. Middleton, R.F.C.
8192 2nd Air Mech. A. E. Pitcher, R.F.C.
6773 1st Air Mech. A. V. Scholes, R.F.C.
7754 2nd Air Mech. H. T. Tabor, R.F.C.
8267 2nd Air Mech. S. H. G. Triggs, R.F.C.
7255 2nd Air Mech. L. G. Venn, R.F.C.
8237 2nd Air Mech. G. L. G Watson, R.F.C.
8191 2nd Air Mech. L. Williams, R.F.C.

The Handling of Aircraft Bombs or Darts.

The Army Council warns the public against approaching, examining or handling explosives, such as bombs or darts, which may sometimes be accidentally dropped from aircraft during practice or may be scattered through the accidental fall of aircraft.

Should injuries be suffered by any person through approaching, examining or handling such explosives, or any other explosives used experimentally or for the training of troops, the Council will not be prepared to pay any compensation.

Persons finding objects of this nature should at once report the matter to the nearest military or police station.

Pay of R.F.C. Clerks, &c.

A Royal Warrant, issued as an Army Order on Dec. 22nd, amends the rates of pay for warrant officers, non-commissioned officers and men of the Royal Flying Corps employed as clerks in that arm to the following:—Superintending Clerk, 6*s*. 9*d*.; Flight-Sergeant, 5*s*. 6*d*.; Sergeant, 4*s*. 9*d*.; Corporal, 4*s*.; 1st Class Air-Mechanic, 3*s*.; 2nd Class Air-Mechanic, 2*s*.; 3rd Class Air-Mechanic, 1*s*. 8*d*.

These rates shall not apply to soldiers now serving as clerks, who will continue to draw their present rates as long as they serve in their present ranks. On promotion, however, they shall be paid the rates now laid down, unless in any case the rate they are now drawing is higher than the new rate of the rank to which they are promoted. In that case they may continue to draw the rate they are now drawing.

The British Air Service

"PER ARDUA AD ASTRA"

UNDER *this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the* LONDON GAZETTE. *it is not repeated in this column..*

Royal Naval Air Service.

Admiralty, December 19th.

R. M. Stirling entered as Prob. Flight Officer, Dec. 14th, and appointed to "President," additional, for R.N.A.S., date Dec. 31st.

H. L. Macre entered as Prob. Flight Officer, Dec. 15th, and appointed to "President," additional, for R.N.A.S., date Dec. 31st.

Sub-Lieut. R. N. (Flight Lieut.) A. W. Mylne promoted to Acting Lieut., date Dec. 15th.

Admiralty, December 20th.

The undermentioned have been entered as Prob. Flight Officers for temp. service, and appointed to the "President." additional, for R.N.A.S., to date Dec. 31st; J. A. Cole, K. F. Alford, T. H. Herriot, G. H. Herriot, W. M. Davidson and A. D. Pole.

Admiralty, December 21st.

Temporary Sub-Lieutenants, R.N.V.R.—S. A. Bevington and A. C. Baker, promoted to the rank of Temp. Lieut., R.N.V.R., seniority, Dec. 18th.

C. R. Knowles entered as Prob. Flight Officer for temp. service, date Dec. 18th.

Royal Flying Corps (Military Wing).

London Gazette Supplement, December 18th.

Temporary Appointment at War Office.

Staff Lieutenant.—2nd Lieut. T. Goulburn, R.F.C., S.R., from an Equipment Officer, 3rd Cl., vice Temp. 2nd Lieut. (Temp. Capt.) H. W. Phear, Gen. List; Nov. 15th.

London Gazette, December 19th.

Flying Officers.—Nov. 6th: Temp. Capt. E. F. Elderton. Ches. R., and to be transfd. to Gen. List; Lieut. W. J. Cairnes, Leins. R., S.R., and to be secd. Capt. E. W. Broadberry, Essex R., T.F.; Nov. 8th. 2nd Lieut. A. E. L. Skinner, Norfolk Yeo., T.F.; Nov. 9th. Nov. 14th: Temp. Capt. K. R. Paterson, R. W. Fus., and to be transfd. to Gen. List; 2nd Lieut. L. W. Heathcote, Australian Flying Corps. 2nd Lieut. (Temp. Lieut.) T. F. Preston, Norfolk Yeo., T.F.; Nov. 22nd. Nov. 27th: Lieut. H. C. Burdett, T.F. Res.; 2nd Lieut. H. J. Hamilton, D. of Corn. L.I., from a Flying Officer (Obs.), with seniority from Aug. 30th; 2nd Lieut. G. F. Blackburn, S.R. Nov. 28th: Temp. 2nd Lieut. C. J. Dickinson, R. W. Kent R., and to be transfd. to Gen. List; 2nd Lieut. G. W. Dowding, S.R.; Temp. 2nd Lieut. E. H. M. Fetch, Gen. List; 2nd Lieut. (Temp. Lieut.) E. A. Stewardson, R. W. Surr. R., T. F.; 2nd Lieut. G. R. Beck, London R., T.F.; Temp. 2nd Lieut. (on prob.) H. L. Barlow, R.E. Nov. 30th: Lieut. F. L. Baker, 67th Canadian Inf. Bn.; Temp. 2nd Lieut. P. S. Williams, Gen. List.

Equipment Officers, 2nd Class.—From the 3rd Cl., Dec. 1st: 2nd Lieut. (Temp. Lieut.) W. R. Bruce-Clarke, Lon. R., T.F., and to retain his temp. rank whilst so employed; Temp. Lieut. H. N. Nowell, Gen. List. From the 3rd Cl. and to be Temp. Lieuts. whilst so employed: 2nd Lieut. G. Jacques, S.R.; 2nd Lieut. E. W. Havers, S.R.; Temp. 2nd Lieut. J. D. Drysdale, Gen. List; 2nd Lieut. F. C. Rowe, S.R.; 2nd Lieut. J. MacD. Patten, S.R.; Temp. 2nd Lieut. A. K. Hall, Gen. List; 2nd Lieut. J. E. R. Avery, S.R.

3rd Class.—2nd Lieut. (on prob.) J. T. Rossiter, S.R.; Sept. 1st. 2nd Lieut. (on prob.) E. T. Driver, Gen. List; Oct. 2nd. Temp. 2nd Lieut. L. Legge, Gen. List; Nov. 11th.

Memoranda.—The undermentioned to be Temp. 2nd Lieuts. (on prob.) for duty with R.F.C.: Cadet J. G. Harriott, from an Officer Cadet Bn.; Nov. 22nd. Dec. 8th: Sergt. J. A. Atkinson from H.A.C., T.F.; Pte. A. D. Birkhead, from L'pool R., T.F.; Flight-Sergt. E. A. Tottle, from Hampshire Aircraft Parks, T.F.

Supplementary to Regular Corps.—The undermentioned 2nd Lieuts. (on prob.) are confirmed in their rank: A. L. Constable, B. Gaskin, F. I. Fleming, H. T. Lydford, A. C. Reeves, W. L. Shaw, A. Graham, J. F. B. Smith, J. C. Rimer, A. Burgess, R. A. W. Collet, J. Farquharson, W. T. Davis, J. Page, A. C. Day, F. J. E. Stafford, R. G. Robson, F. C. Smith, H. Simson, V. T. Norminton, G. F. Blackburn, W. F. Dobson, E. Armitage, H. Blofeld, G. W. Dowding. The undermentioned to be 2nd Lieuts. (on prob.). Nov. 21st: C. R. F. Wickenden, J. W. G. Boyd, C. L. Hardy; Dec. 1st. Dec. 8th: P. P. Nicholl, D. H. Blaikie, J. C. F. Williams, H. L. Dawson, C. G. Sweet, M. Thompson, H. C. Perks, V. S. Holbrook, R. Knott, P. Ogden, C. E. Fairburn. The notification in the *Gazette* of Nov. 11th of the appointment of L. A. Owen to be 2nd Lieut. (on prob.) is cancelled.

London Gazette Supplement, December 20th.

The undermentioned to be 2nd Lieuts. for service in the Field:—*For duty with*]*R.F.C.*: Acting Sergt.-Maj. J. D. Payne, from R.F.C.; Oct. 30th. Corpl. B. Ankers, from R.F.C.; Nov. 5th.

The undermentioned to be Temp. 2nd Lieuts. (on prob.):—*For duty with R.F.C.*: Corpl. C. S. Goodfellow, from R.E.; Oct. 29th. Nov. 14th: Acting-Sergt. P. S. Taylor, from A.S.C.; Pte. F. Tapping, from Can. A.S.C.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed: 2nd Lieut. (Temp. Lieut.) R. L. Chidlaw Roberts, Hamps. R.; Dec. 4th. Dec. 5th.: 2nd Lieut. W. H. Tolhurst, S.R.; 2nd Lieut. (Temp. Lieut.) B. P. G. Hunt, Shropshire, Yeo., T.F.; 2nd Lieut. H. A. Wood, S.R.

Flying Officers.—Nov. 27th: Lieut. (Temp. Capt.) H. F. Game, R. War. R., S.R., to be second., and to relinquish his temp. rank; 2nd Lieut. (Temp. Lieut.) C. S. Vane-Tempest, Durh. L.I., T.F.; Temp. Lieut. A. N. Solly, Gen. List, from a Flying Officer (Obs.), with seniority from July 27th; 2nd Lieut. R. H. Dryden, Northumbrian Brig., R.F.A., T.F.; Temp. 2nd Lieut. A. Binnie, R.A., to be transfd. to Gen. List; 2nd Lieut. H. Simson, S.R. Nov. 28th: 2nd Lieut. T.M. Southorn, Lowland Brig., R.F.A., T.F.; Temp. 2nd Lieut. A. A. Harcourt-Vernon, E. Surr. R., and to be transfd. to Gen. List. Nov. 29th: Temp. 2nd Lieut. C. O. B. Beale, Gen. List; Temp. 2nd Lieut. (on prob.) W. G. Holbrow, Gen. List; 2nd Lieut. H. Blofeld, S.R.; Temp. 2nd Lieut. J. Macgeorge, Gen. List. Nov. 30th: 2nd Lieut. C. Eales, Devon R., T.F.; Temp. 2nd Lieut. C. R. H. Jackson, Gen. List; Temp. 2nd Lieut. W. Selwyn, Gen. List; Lieut. A. T. Eden-Eadon, N. Staff. R., S.R., and to remain secd.; Temp. 2nd Lieut. G. C. Holman, A.S.C., and to be transfd. to Gen. List; 2nd Lieut. C. J. Pullen, E. Anglian (Essex) R.G.A., T.F.; Temp. 2nd Lieut. (on prob.) C. J. Hewins, R.E.

Adjutant.—Capt. J. D. Strong, 90th Punjabis, Ind. Army; Nov. 8th.

Depôt Commander.—Capt. (Temp. Maj.) G. B. Haynes, R.A., from a Park Comdr. and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

Park Commanders.—From Equipment Officers, 1st Cl., and to be Temp. Majors whilst so employed: Capt. L. F. R. Fell, S.R.; Nov. 1st. Capt. R. Hall, R.W. Fus., and to be secd.; Dec. 6th.

Equipment Officers, 1st Class.—From the 3rd Cl., and to be Temp. Capts. whilst so employed; Nov. 1st: Temp. Lieut. E. M. Bettington, Gen. List; 2nd Lieut. W. D. L. Jupp, S.R.; Dec. 1st; Temp. 2nd Lieut. (Temp. Lieut.) P. B. Hunter, A.S.C.; 2nd Lieut. C. G. Smith, S.R.

Equipment Officers, 2nd Class.—From the 3rd Cl., and to be Temp. Lieuts. whilst so employed: 2nd Lieut. T. Bullen, Som. L.I.; Nov. 1st. Dec. 1st: 2nd Lieut. H. R. Vagg, Som. L.I.; 2nd Lieut. S. G. Frost, S.R.; Temp. 2nd Lieut. A. S. Ellerton, Gen. List; 2nd Lieut. L. H. B. Cosway, S.R.; 2nd Lieut. A. R. Thomas, S.R.; Temp. 2nd Lieut. A. S. Morris, Gen. List.

Wing Instructors in gunnery (graded as Flight Commanders).—From Flying Officers. Sept. 14th: Lieut. (Temp. Capt.) A. G. H. Carr, York and Lanc. R., T.F., and to retain his temp. rank whilst so employed; Capt. R. Bell-Irving, 29th Canadian Inf. Bn.; Temp. Capt. H. E. Dixon, Gen. List. From Flying Officers, and to be Temp. Capts. whilst so employed: Temp. Lieut. S. H. Bird, Gen. List; 2nd Lieut. (Temp. Lieut.) W. G. B. McKechnie, R. Sc. Fus., and to be secd.: Temp. 2nd Lieut. G. Ross-Soden, Gen. List. Sept. 21st: Temp. Lieut. S. E. Adams, Gen. List; Temp. 2nd Lieut. W. H. Miles, Gen. List; 2nd Lieut. R. G. Heyn, S.R.; 2nd Lieut. M. R. N. Jennings, S.R.; Oct. 4th. Capt. M. G. B. Copeman, Leic. R., a Flight Comdr.; Oct. 27th.

The undermentioned 2nd Lieuts. (on prob.), S.R., to be Temp. Lieuts. whilst serving with R.F.C. Nov. 1st: C. H. Knight, Dorset R.; N. Brearley, M.C., L'pool. R.; D. G. A. Allen, Durh. L.I. (Substituted for the notification in the *Gazette* of Dec. 16th.)

Supplementary to Regular Corps, Royal Flying Corps, Military Wing.—2nd Lieut. (on Prob.) J. H. G. Wilson resigns his commission; Dec. 21st.

London Gazette Supplement, December 21st.

Wing Commanders.—From Sqdn. Comdrs., and to be Temp. Lieut.-Cols. whilst so employed. Dec. 5th: Capt. (Temp. Maj.) the Hon. J. D. Boyle, Rif. Brig.; Capt. (Temp. Maj.) P. K. Wise, R. War. R.; Capt. (Temp. Maj.) W. F. MacNeece, R.W. Kent R.; Temp. Maj. F. H. Cleaver, Gen. List; Temp. Maj. the Hon. A. S. Byng, Gen. List.

Flight Commanders.—From Flying Officers, and to be Temp. Capts. whilst so employed. Dec. 6th: Temp. Lieut. J. M. E. Shepherd, Gen. List; Temp. Lieut. K. F. Balmain, Gen. List.

Flying Officers.—Nov. 28th: Temp. 2nd Lieut. F. F. H. E. Kolligs, N. Lan. R., and to be transfd. to Gen. List; 2nd Lieut. A. E. Townsend, Durh. L.I., T.F.; Temp. 2nd Lieut. B. Mews, Gen. List; Temp. 2nd Lieut. W. T. Price, attd. R. War. R. Nov. 29th: 2nd Lieut. R. G. Robson, S.R.; 2nd Lieut. F. C. Smith, S.R.; Temp. 2nd Lieut. J. H. Hayward, Gen. List; Temp. 2nd Lieut. F. P. Holliday, Gen. List, from a Flying Officer (Ob.), with seniority from Mar. 10th; 2nd Lieut. J. L. Bicknell, Glouc. R., T.F.; Temp. 2nd Lieut. A. J. Lucas, Gen. List; Temp. 2nd Lieut. C. F. Jex, Gen. List; 2nd Lieut. F. J. E. Stafford, S.R.

Equipment Officers, 2nd Class.—From the 3rd Cl. Dec. 5th: Temp. Lieut. W. B. Cushion, Gen. List. And to be Temp. Lieuts. whilst so employed: 2nd Lieuts., S.R.; G. A. Crane, C. G. Jones, L. A. Clayton, J. E. Rendle.

3rd Class.—Dec. 6th: Temp. 2nd Lieut. (on prob.) S. R. Winkworth, Gen. List; 2nd Lieut. (on prob.) H. Wilson, S.R.; 2nd Lieut. E. G. Webber, Gen. List; 2nd Lieut. F. R. Wilkins, Gen. List; Temp. 2nd Lieut. (on prob.) G. H. Creighton, R. Ir. Fus., and to be transfd. to Gen. List; Temp. 2nd Lieut. (on prob.) F. J. Cunningham, Gen. List; 2nd Lieut. (on prob.) C. E. Bagram, S.R.; Temp. 2nd Lieut. (on prob.) A. W. Barnett, Gen. List; Temp. 2nd Lieut. (on prob.) S. H. Child, Gen. List; Temp. 2nd Lieut. (on prob.) J. B. Crabb, Gen. List; 2nd Lieut. L. H. Clifford, S.R.; 2nd Lieut. (on prob.) R. J. Anderson, Lowland Divl. Engrs., R.E., T.F.; Temp. 2nd Lieut. (on prob.) J. H. A. Bryne, Gen. List; Temp. 2nd Lieut. C. H. Blakeway, Gen. List; 2nd Lieut. (on prob.) E. Brown, S.R.; Temp. 2nd Lieut. (on prob.) B. O. Butler, Gen. List; Temp. 2nd Lieut. (on prob.) H. W. Armstrong, Gen. List.

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The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

New Club House.

The address of the Club is now 3, Clifford Street, New Bond Street, W.

The new premises will be open to Members on January 3rd, 1917.

Suspension of Entrance Fees of New Service Members.

Until further notice, Service Members will be elected to the Royal Aero Club without Entrance Fee.

Annual Subscription.

In accordance with the resolution passed unanimously at the Special General Meeting of the Members held on the 27th July, 1916, "the subscription to the Club for the year 1917 and thereafter will be £5 5s."

Servants' Christmas Fund.

The Subscription List for this Fund is now open.

THE FLYING SERVICES FUND
administered by
THE ROYAL AERO CLUB.

The Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

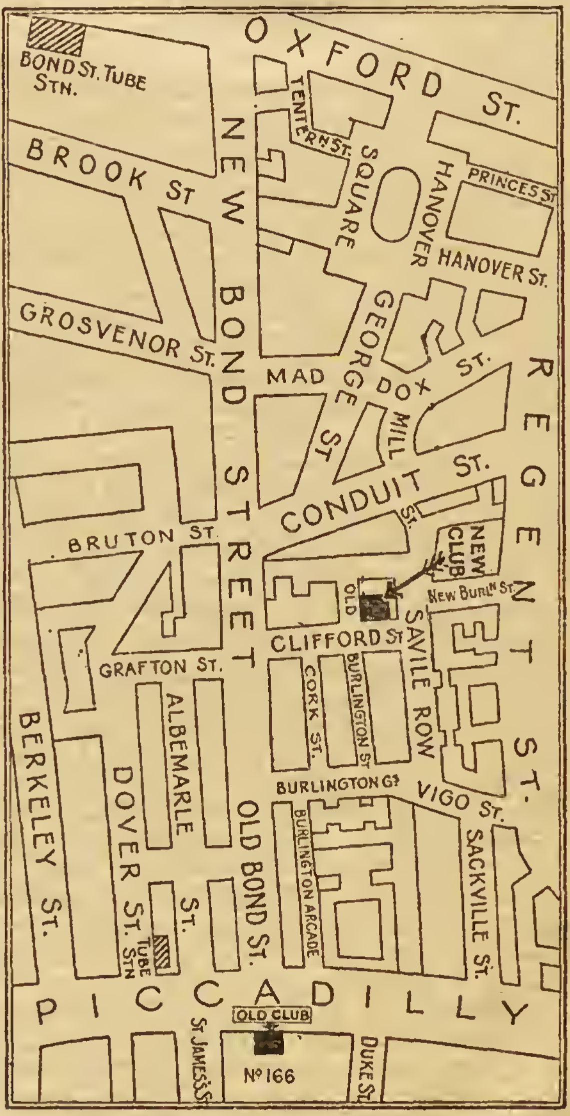
The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers, and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, W.

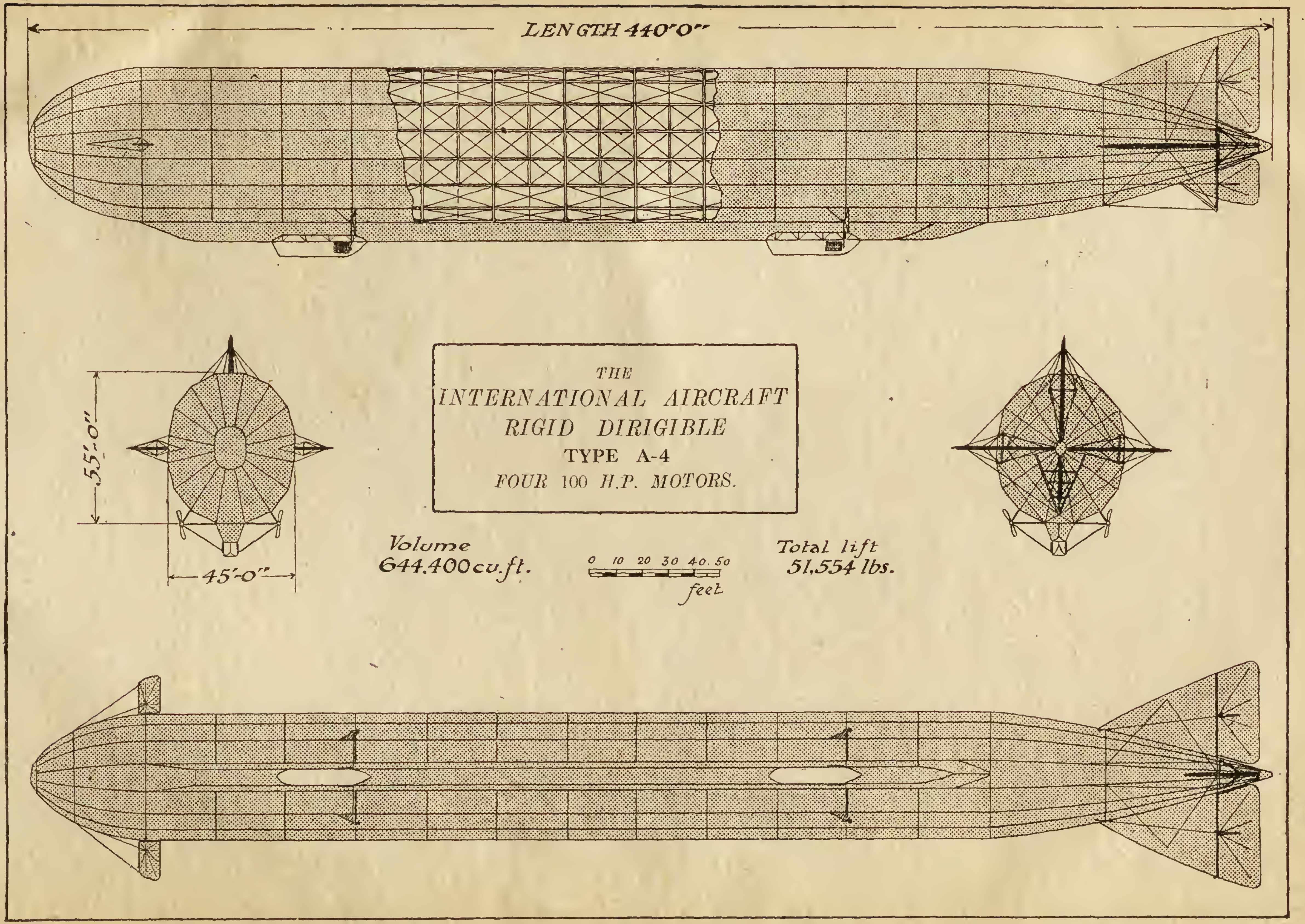
Subscriptions.	£	s.	d.
Total subscriptions received to December 21st, 1916	11,098	13	3

B. STEVENSON, Assistant Secretary.

3, Clifford Street, New Bond Street, W.



Plan showing position of New Club Building, 3, Clifford Street, New Bond Street, W., which will be opened on Wednesday, the 3rd January, 1917.



THE INTERNATIONAL AIRCRAFT RIGID DIRIGIBLE.—Plan, side and end elevations to scale. *(See next page.)*

THE INTERNATIONAL AIRCRAFT RIGID DIRIGIBLE.

The following interesting particulars of an American design for a rigid dirigible appeared in a recent issue of *Aircraft* :—The International Rigid Dirigible, the rights and patents of which were bought out by the American Aircraft Co., embodies the most successful engineering features that have been learned through practical experience and observation and study by its engineers in both Europe and America. Many original ideas in regard to their construction and operation are employed. Aside from the completed general design of this type of craft, also all technical data that could be collected in regard thereto, empirical tests to ascertain its resistance, stability, steerability and side stresses have been made at the Navy Yard at Washington, D.C., as well as at other technical institutes, tests were made of constructional features. These tests were observed by Mr. Louis L. Kaess, Mr. Vincent J. Buranelli and Mr. Maximilian Jagemann, designers and experts connected with the Company. The designs for four types have been got out, but the accompanying particulars refer to the largest type (" A4 ").

The over-all length of the balloon frame is 440 ft., and is oval in shape, having a maximum diameter of 55 ft., and a minimum diameter of 45 feet. The object of employing this oval system of construction is to obtain vertically a high strength to weight ratio, since the major forces acting on a dirigible are vertical. This is due to the fact that the most serious side stresses act vertically, such as when the balloon is climbing, and also the overhung buoyancy, the moments of which due to the length become considerable. The fineness ratio of the hull or balloon frame is 8·75. This ratio, which is low compared to the old Zeppelin, greatly reduces the moments of the overhung gas, for the lift is more concentrated. Also gives a higher cross section, thereby increasing the constructional efficiency of the entire framework. Another feature brought about due to the oval formation transversely, is that the gas containers, being oval in shape, and as their tendency is, when made cylindrical, to pull in this section, there is then a more even distribution of pressure.

The hull is a 16-sided polygon, having 15 compartments having an average length of 25 ft. There are 13 straight compartments, and three tapering—one in the front and two in the rear. The total displacement of the hull is 644,400 cubic ft., having a total lift of 51,554 lbs. The average volume and lift per compartment is 42,900 cubic ft. and 3,437 lbs. respectively. The centre of buoyancy of the balloon is 45 per cent. back. Beneath the hull is a square keel, which is 300 ft. in length. This keel is constructed of members similar to those employed for side members in the hull, the top members being integral with the hull. The purpose of this keel is to act as a backbone, and strengthen the balloon vertically as well as to some extent transversely. 30 per cent. of the strains acting on the balloon frame will be taken up by the keel. Numerous stress diagrams and tests made in regard to the construction of this hull show that a factor of safety of 2·5 is possible. This is very high for a rigid dirigible, and is sufficient, considering that, unlike an aeroplane, a rigid dirigible is not subject to the great variation of pressure due to its dynamic support being altered by dives or gusts. This high factor of safety is possible in this case, due to features which have been incorporated in its design, which, in some cases, require the sacrificing of certain efficiencies, as, for instance, in regard to speed. Also, the hull, which is to be constructed of a combination of steel and aluminium alloy girders, will be heavier than that of European rigid ships, thereby reducing the percentage of useful load that can be carried, but increasing the factor of safety. This hull construction, which will consist in the main girders of members 8 ins. square, will be trussed with double 4,000 lbs. cable at the centre. This trussing will vary, as do the moments of the forces, both dynamic and static acting on the ship from its centre of buoyancy and gravity to the end.

Attached to the rear of the balloon frame at its centre is the empennage, which consists of the horizontal and vertical stabilisers and rudders. These surfaces are monoplane, and have a total area of stabiliser of 2,049 sq. ft. The elevator flaps have a total area of 1,174 sq. ft., and the rudder of 600 sq. ft. These surfaces are trussed securely to the hull by means of cables that are anchored to a mast below the balloon, which is attached to the last ring. The depression wires are attached to the vertical stabiliser, which in turn receives its support from them. This empennage is located so that the centre of pressure of the elevator flaps is at a distance of 242 ft. from the centre of gravity. At a distance forward from the centre of gravity of 158 ft. two auxiliary elevators are located, one on each side, having an aspect ratio of 2 to 1, and an area of 182 sq. ft. These elevators, being operated separately, can be put either positive or negative, as compared to the rear elevators, thereby making possible an increase of lift dynamically without the balloon being inclined from the horizontal. Wind tunnel tests show that with both surfaces positive the lift at 60 m.p.h., when the front elevators are inclined at a greater angle than the rear, so as to counterbalance them, due to its lesser surface, amounts to 3,600 lbs., at an average of 8 degrees, thereby making possible a considerable increase of altitude. When the front surface is positive and the rear negative at 10 degrees, the lift on the underside of the hull, due to its inclination, amounts to 4,200 lbs. at 60 m.p.h. Also, at the above-mentioned speed the controls, when used to their fullest extent, have six times the effect necessary to elevate or direct the balloon. Due to this, it is possible to still navigate or direct the balloon at a speed of 20 m.p.h.

These large elevating surfaces are equipped with tillers 5 ft. in height, to which are attached the ⅝-in. cables which run to the gondola through the inside of the hull. In order to make possible operating these controls by one man, a mechanical advantage has to be employed at the gondola controls of 1 to 12. This is brought about by the use of lever and ratchet mechanical devices. The front elevators are operated by a lever directly opposite the lever operating the rear elevators, and with a reduction of 1 to 3 for simplicity and ease of operation. The rudder is operated by means of a wheel and sprocket arrangement.

Ballast of the water variety is used and is released by means of a valve, operated at the will of the pilot. The gas is released through three valves, one located at the bottom, used for inflation, commonly termed the "tail" valve; and a concentric safety and manœuvring valve, located at the top of the gas bag, and operated by means of a cord which passes through the tail valve at the bottom. The safety valve works automatically.

There are two gondolas, 32 ft. in length, with a beam of 6 ft. and a depth of 5 ft., directly attached to the keel, and streamlined as much as possible. The keel covering at the gondolas is removed to provide a view for the occupants. The front gondola contains all the controlling apparatus, and the rear one most of the crew. The space in the keel amidships can be used for passenger accommodation, it being square and quite adaptable for this purpose. The distance between the two gondolas is about 150 ft., and the gondolas are counterbalanced about the centre of buoyancy. Their location is such as to eliminate as much as possible uneven buoyant forces. The petrol and ballast tanks are located at the bottom of the gondolas, and equally divided between each gondola. The consumption or release of ballast must be such as to cause no unequal weights to any great extent in either gondola.

There are four motors, which total 400 h.p. The motors are of the 6-cylinder, 4-cycle, vertical type, and are mounted side by side at the rear of each boat. These motors run at a speed of 1,400 r.p.m., and are easily accessible. A gearbox located at the driving end of each motor contains gearing mechanism, which, by means of shafting, transmits the power to the propellers, which are overhung at the side of the balloon frame. These propeller brackets are covered in to act somewhat like a bilge keel. No clutches are to be employed, nor are they necessary, considering that the modern aeronautical motor can be throttled at an ineffective propeller speed. The gear ratio is 1·4 to 1, the propeller turning at 1,000 r.p.m. The propellers have a diameter of 9 ft., 7-foot pitch, and are made of laminated wood.

The air pumps for the air ballonet are operated by one of the engines in each car.

Wireless apparatus is located in forward gondola, the current being supplied from a dynamo driven by one of the motors.

ARMCHAIR REFLECTIONS

BY THE "DREAMER"

WHEN the history of the war comes to be written—I have an idea I've seen that phrase before—I hope somebody, or a syndicate of somebodies, one from each of the numerous flying bases in France, Egypt, Salonica and the various other places where bases are established, will write the history of the war from the flying-man's point of view, for I am sure there is material there for one—or half a dozen—of the most interesting and instructive books ever written for those concerned with the riding of the wind.

The history of the war will, as a matter of course, be compiled in the usual way, and the deeds of our heroes of the air will be included; but it is poor stuff, that which is written by the professional history writer. I have some of those history books on my bookshelf, they are on the topmost shelf, and I do not possess a pair of library steps, by which you shall guess that the dust lies thick upon their upper edges. I can see some of them as I write. There are among others *The Thirty Years' War*, *The Siege of Paris* and *With the Flag to Pretoria*, all good enough books in their way, but of little interest to the man who was not a soldier either by birth or inclination. They miss the human note, these weighty tomes, and they miss the humorous. Full enough they are, what I remember of them, of the inhuman. If you want to read of regiments becoming ambushed and swept away, if you want to know about men laden like pack-mules marching at the dead of night over strange country led by a guide in the employ of the enemy, with the inevitable result, if you have a taste for knowing of the thousand and one manners in which men can be swept away to eternity like chaff before the wind, I commend you to my top shelf.

The Thirty Years' War shall find you reading for a year, with another added in making up your tables of killed and wounded if you are fond of that sort of thing. Or you shall read of Paris during, if I remember rightly, the five months or so, from September to January, with the iron hand of Germany gripping it tightly; of the nine days of bombardment, during which less damage was done than on any one of our little bombing raids. Spion Cop may interest you if you have the right appetite, but not one word of humour shall you find between the covers of the books on that high shelf.

The book that I want is in the writing by men who have an eye for life, and not for death. Just how our boys live out there, and the schemes they get up to in their endeavours to make themselves comfortable under trying circumstances. The story of their little concerts and theatrical efforts, the story of all that which has happened to them, and the stories, those wonderful stories, of all that which never happened, but which are jolly good yarns nevertheless, although born of the imagination.

I wish it were my lot to write that book; I have enough yarns in stock at the present moment to half fill it. These yarns get told around at times, but only the very few ever hear them. Here is one, as a sample, showing what strange things even the bravest of the brave will do under stress of circumstances, and when caught unawares. I will give it in sequence as told to me by the pilot, whom I will call Mr. A.:—It was in the early days, and he and an observer had to take a machine from ——— to ——— for delivery. Darkness found them at ———, where they decided to stay the night. Here Mr. A. will take the helm. "We were mooching about with nothing to do, when the doctor asked if we would like to go up and see his hospital. This was early in the war, and I had never heard a gun fire or a bomb drop, having only just got out there. I was sitting on the side of a cot talking to one of the fellows, when, crash! Of course the Germans had selected that very place and night for a firework display. I rushed out to find all lights extinguished except one large electric light in the yard, for which nobody could find the switch. I got a pair of steps with the idea of taking the lamp out. Halfway up, bang! crash! I fell off, I don't mind telling you. Up again. I would *not* be frightened like that. Near the top I missed a step. I missed it several times. Bang! (much nearer). I would NOT funk, I would go slowly. I went slowly and missed the step again, for the simple reason that it was not there. I got the lamp out and got down. Crash! not far from where I was standing. Mind, I'd never heard anything like it before. That last one did it, I was in a blue funk. My observer, Mr. B., had been through the mill before. I could not see him in the dark, but I guessed he was calmly looking on somewhere. There was a locomotive standing on a siding. I gave a look round lest I should be seen. A bang not 50 yards away knocked what little pluck I had left in me to smithereens. I dived head first under that locomotive whack on top of somebody else. 'Helloa, A.,' said a voice I knew, 'you here?' It was my observer."

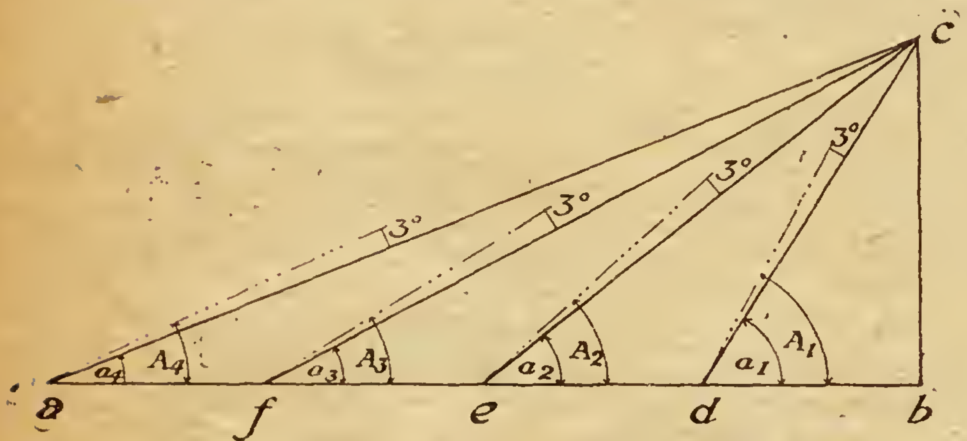
Now, are not the thousands and thousands of yarns of that description that are going about worth writing up, together with life as it is lived out there? I think they are. Just think of the "mud stories" that are being told. The one that follows is evidently rather "stretched," but it is illustrative. A man home on leave was asked whether it was true about the amount of mud. "One day," he replied, "I dropped my cap, which disappeared in the mud. I was walking about looking for it when a voice cried, 'Hi, look out, you're standing on my hand.' 'What the devil do you want to lie about down there for?' I asked. 'Lie about be ——,' was the reply, 'I'm driving a transport.'"

ANSWERS TO CORRESPONDENTS

*If in doubt about anything aviatic, write to "*Flight*" about it.*

G. W. (Southsea).

In describing a rough-and-ready method of finding the pitch of an airscrew, we referred to theoretical pitch, taking the chord angles as being equivalent to the true helix angles. In practice this is not, of course, usually so, the chord angles being generally greater than the helix angles. The accompanying diagram will illustrate our point. The lines *dc*, *ec*, *fc* and *ac* represent the helix angles, which we have called a_1, a_2, a_3, a_4, respectively. For the sake of clearness we have shown all the chord angles 3 degrees greater than the helix angles, although this does not necessarily represent general practice. As a matter of fact, there are, we believe, propellers in which, at certain points, the chord angles are actually smaller than the helix angles. The angles A_1–a_1, A_2–a_2, A_3–a_3, A_4–a_4, are called the angles of attack, and correspond to the angle of incidence of an aeroplane wing. In our diagram all these angles of attack are 3 degrees, but they may, as we have pointed out, vary along the blade of the airscrew. Near the boss, where the blade has a small velocity, some propellers have sections resembling a streamline shape rather than an aerofoil section, the blade being here more in the nature of a supporting arm. Consequently in that case the chord angle is the same as the helix angle.



Glider (Kingston).

There is not at present any simple formula from which the amount of dihedral angle can be calculated. It is, we believe, general practice to calculate the position of the centre of projected side area of the whole machine, and then, if this centre lie on the same line as the centre of gravity, to give the wings a dihedral angle of about 2 degrees. If the centre of area lies below the c.g., a greater dihedral is given, and if it lies above it, a smaller. The position of the centre of pressure of an aerofoil can most simply be, and usually is, determined by tests on a scale model in a wind tunnel. In a tapering wing, the centres of pressure would not, of course lie on an axis at right angles to the flight path of the machine. This fact is sometimes made use of by designers in attempting to obtain increased lateral stability, usually by incorporating with the tapering wing a diminishing angle of incidence, counting from the root towards the tip.

A. G. B. (Beckenham).

1. The action of the Pitot tube type of air speed indicator was described in our "Column" on page 750 of our issue of August 31st, 1916. Under the Defence of the Realm Regulations we cannot reply to Questions 2 and 3. 4. Mr. Hawker has, we believe, looped the loop on one of the Schneider Cup type Sopwith seaplanes, but, generally speaking, seaplanes are not suited for this evolution.

J. D. R. (Temple Bar).

The subjects of bird flight and insect flight were pretty exhaustively dealt with in the columns of "Flight" in 1911. One article, entitled "The Vortex Principle of Flight," by T. A. Dring, commences on page 489 of the issue of June 3rd, 1911, and is continued through a considerable number of issues. In this article the movements of an insect's wings, as distinct from those of a bird, are very fully described, and some highly interesting suggestions put forward. The other article, by Dr. E. T. Hankin, M.A., D.Sc., is entitled "A Study of Bird Flight," and the first instalment of this appears on page 691 of our issue of August 12th, 1911. Both articles will, we think, prove of help to you, and certainly aroused great interest and a certain amount of discussion at the time.

N. F. B. (Hamilton).

Your best course would be to enter a good works as an apprentice. Write to some of the firms advertising in "Flight" and ask if they have any vacancies.

A. M. (Belfast).

The articles on "Soaring," with the photograph of the Wright glider stationary in the air, appeared in "Flight" of November 11th and 18th, 1911.

Postman (Guildford).

The first aerial post in the United Kingdom was flown between Hendon and Windsor on Saturday, September 9th, Monday, September 11th, and Tuesday, September 12th, 1911, the carriers being Hamel and Driver on Blériots, and Gresswell on a Grahame-White biplane. Hubert on a Grahame-White biplane was also to have made trips, but he had a smash in starting from Hendon on the Monday.

R. E. (Edinburgh).

The first passenger flight on a monoplane was made at Issy-les-Moulineaux on January 5th, 1909, when M. Welferinger carried M. Robert Gastambide on "Antoinette IV" for a distance of half a kilom.

* * *

A Double Fatality.

An inquest was held on December 22nd on 2nd Lieut. P. A. Wright and 2nd Lieut. Frank Leslie Garner, both R.F.C. When flying in a biplane recently the two officers saw a machine that had alighted in a field, and apparently decided to make a descent with a view to assisting their colleagues. Owing to a sudden stoppage of the engine the biplane nose-dived from a height of 400 ft. The engine fell on Mr. Garner, who was killed instantly. The machine burst into flames, and two agricultural labourers released Mr. Wright from the débris and recovered the body of Mr. Garner. Mr. Wright received attention at a V.A.D. hospital, and was afterwards removed to another, where he died within a few hours. Verdicts of "Accidental Deaths" were returned.

Another Fatal Accident.

An inquest was also held on Dec. 22nd on Lieut. H. R. Deighton Simpson, R.F.C., who was killed on Dec. 20th.

A witness stated that Lieut. Simpson was an expert pilot, and had been on active service. Immediately before the accident he had looped the loop a dozen times, and flew upside down for some distance. Afterwards he rose as if to loop again, when apparently the right plane gave way as the machine was perpendicular. The pilot regained control of the machine, which started to *vol-plane* down, but from a height of 500 ft. it fell like a stone. A verdict of "Death from Misadventure" was returned.

Aerial Activity on Salonica Front.

Writing from Salonica on December 14th, Mr. G. Ward Price states that "German airmen have shown a little more activity lately upon this front, with disadvantageous consequences to themselves. Within three days three enemy machines have been brought down at different parts of our line. One flew over Salonica and was shelled by the Fleet."

AIRISMS FROM THE FOUR WINDS

When the time comes, it will be highly interesting to see the figures in connection with our National Aircraft Insurance Scheme. There should be a nice comfortable little credit balance to transfer to the other side of the War Balance Sheet, and thus save the much-taxed public a trifle. It seems a pretty profitable game, anyway, for municipalities and other large bodies to be their own insurers judging by the results of the L.C.C. in regard to its own buildings against fire and aircraft risks. The value represents £15,000,000. The premiums this year amounted to £26,600, and the loss to £743. So profitable is this municipal insurance scheme that the insurance fund stands at £163,870. Money saved and invested produces an income of £1,090 a year, more than enough to pay all losses, which have averaged for 10 years only £520 a year. What an object lesson and incentive to go and do likewise.

* * *

Capt. Roald Amundsen, of South Pole fame, looks to the aeroplane for carrying him upon the last stretch of his journey in search of the North Pole in 1918. Failing his hope that he will drift over the Pole, he has made up his mind to take his chance through the air. Capt. Amundsen ought to know what sort of bric-à-brac should form his impedimenta for the occasion and the sort of appendages and accessories which may help to spell success or failure, so it is as well that he is making himself responsible in this direction by personally supervising the construction of his proposed machine in America. Our only wonder is what he is going to do with the beastly thing—the Pole, not the machine—when he *does* harness it. Perhaps he'll have with him the other end of a wire and be able to try out a "Hello, are you there?" direct to his previous love the South Pole, without waiting for a trunk call around the globe. One thing, when he gets back, he may find the war over.

* * *

The accession of the Rev. Haslam to the R.F.C. appears as if it may bring forth a new grade in the Air Services. In no less an oracle than the *Guardian* a plea for "sky-pilots" is put forward by the Rev. H. K. Bros, Chaplain 2nd Cavalry Brigade, writing from No. 1 N.Z. Hospital, France. Thusly he interprets the possibilities of such an innovation, and apparently has the backing of the common or garden strafing pilot to that end: "I believe I am right in saying that every branch of the Service has its Chaplain except the Air Service. Would it not be possible to have real 'sky pilots' attached to the Flying Corps at various 'wing' or squadron headquarters, who might hold services, when possible, and look after the social side of the mechanics' life—a life which I am told by those who should know is very laborious? I have recently while in hospital met several officers in the Flying Corps, and they all seem to think that it would be a very good thing if Chaplains could be attached to the Air Service. At the present time a branch of the Service whose members perhaps are in more constant danger than any other branch appears to be somewhat left out in the matter of spiritual ministrations."

* * *

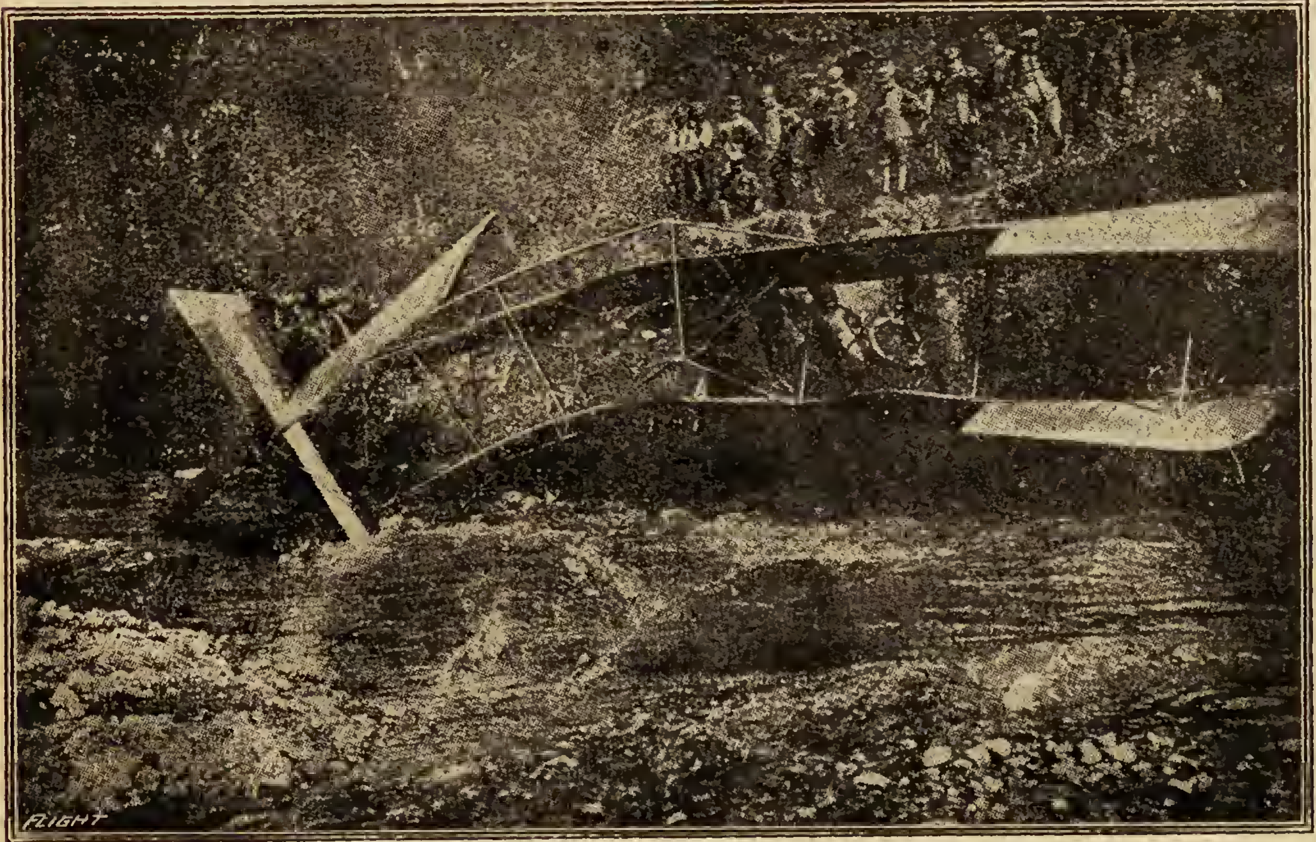
According to a correspondent in America, Laddie Laird, the exhibition pilot, flew over the City of St. Paul, Minn., on election night and flashed the results of the election to the citizens below. Cute idea, that; we might go one better, and start an aerial news-plane—"The Evening Star"—and give Londoners "all the winners" on similar lines, and save paper. We shall have to consult *some* expert as to how this can be worked on the "subscribers only" basis.

* * *

Whitened kerbs, &c., are the antidote of Zepp.-raid black night, and so it is to be hoped the response to the Commissioner of Police's reminder to the Metropolitan local authorities will be generous. The Westminster City Council, which is generally the leader in all up-to-date municipal methods, has long since made their posts and refuges conspicuous by this method, and they now go a step further by providing white jackets for their night workmen, so as to help guard them against the traffic.

* * *

Bermondsey Borough Council is one of the latest bodies to support the action taken by Camberwell in asking the Board of Trade to put forward some legislative measure making all liabilities for damage to persons and property in the British Isles caused by hostile aircraft or by bombardment from enemy's ships or by vibration or damage from same, or from our own defensive armament, a charge upon the Imperial Exchequer.



An awkward landing somewhere on the Austro-Italian frontier.

To all whom it may concern: In response to an inquiry addressed to the American National Advisory Committee for Aeronautics as to the proper terms for designating male and female operators of heavier-than-air craft, the Committee has decided "that the term 'aviator' is a proper term to use in either case. Such terms as 'birdman,' 'birdwoman,' 'aviatrix,' &c., appear undesirable and unnecessary."

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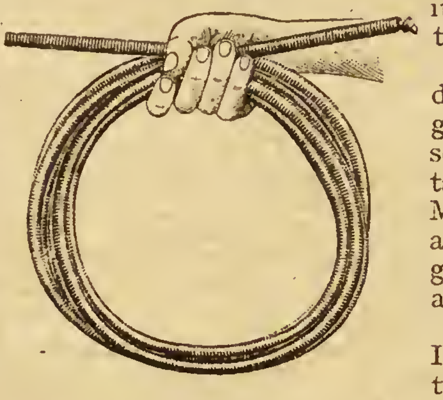
THE accompanying illustration, showing an advertisement in a German aviation paper, is interesting. The first part of it reads: "Shock absorbers for aircraft. *Substitute for rubber.*" One is tempted to paraphrase a now historical expression: "This would appear to indicate a scarcity of rubber in Germany!"



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THE following bright little pen-picture of life at Salonica is extracted from a letter from Miss Thorburn, who is serving with the Scottish Women's Hospital:—

"Three times lately we have had German aeroplanes right over here. The first time it was most amusing. I had a half-day off, and some of the other nurses were invited on to one of the ships to tea, so they took me. We were having tea in the delightfully comfortable gun-room when suddenly we heard curious scufflings and thuds just over our heads; the door was opened, and one of the men said to the first lieutenant, "Hostile aircraft about, sir." Of course we all flew upstairs on to the deck (I got there first), just in time to see and hear the French, Russian, Italian and Greek battleships, and of course the British, opening fire. As we watched the shells bursting closer and closer to the machine, the whole world seemed suddenly to come to an end with a terrific bang—but it was only one of our guns going off just over our heads. It made my head ring for hours, but it was most entertaining, especially as our shots got closer than anyone else's.

"Just as the gunners were getting the range the machine disappeared over the mountains, and we could hear the guns away in the distance as it flew up country, chased by several local machines. The poor man, who was apparently taking photographs, was shot down and killed on the Monastir road. It is horrible to think of it afterwards, but at the time it seemed only like an interesting and exciting game, and I was delighted to see the shells bursting nearer and nearer.

"We had two more over a few days later, and this time I was at work in the kitchen. The noise was terrific, but they were so high up that they sailed round and round over our heads like storks, taking no notice of the firing or of our machines, which were climbing as hard as they could. These also disappeared safely, but one of them did not get back. We were threatened with a big raid two nights ago, but so far nothing has happened."

The late Capitaine L. de Beauchamp, of Essen and Munich bombing fame, who has recently been killed in the Douaumont region.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT'S" *precursor and sister Journal*) *of December,* 1906. "FLIGHT" *was founded in* 1908.

ANOTHER SPLENDID PERFORMANCE BY "LA PATRIE."

The long series of experiments with the Lebaudy airship "La Patrie," now the property of the French Government, and in her way the most formidable engine of war that the world has yet produced, has been crowned by a triumphant flight from Moisson, the little townlet of her birth, to the Aeronautical Department's camp at Chalais Meudon, where on the 15th inst. the airship safely arrived and was duly housed after a splendid run through the air from Moisson, a distance of 52 kiloms., accomplished in 1 hr. 12 mins., the start having been made at 10 o'clock in the morning. Deducting the time occupied in mooring at Chalais Meudon, the speed attained through the air is said to have been at least 45 kiloms. an hour, and in fact rather faster, as some more or less complicated evolutions had to be gone through at Chalais Meudon prior to the descent and before the guide-rope could be seized. The airship was under the management of Capt. Voyer of the Aeronautical Department, and her designer and former pilot, MM. Julliot and Juchmes, followed the airship along the road in an automobile, but were unable to keep up with her. A 14 metre wind (a wind of 31 miles per hour) was blowing across the course the airship took, but notwithstanding this serious impediment she maintained an absolutely straight course from start to finish.

On Monday the 17th "La Patrie" went out again, determining in spite of the mist to pay the expected visit to Paris, and at about 3 o'clock left the park at Chalais Meudon for the metropolis. There was a mild south-west wind, which apparently did not affect the airship in the slightest, and withuot a hitch "La Patrie" arrived about 300 metres above the Elysee Palais at a quarter past three, and announced her presence by hootings on her siren which were distinctly audible in the streets. Finally she passed over the Automobile Club, and returned to Meudon by way of Issy-les-Moulineaux, returning to the shed at Meudon at 3.45. The airship was piloted by Captain Voyer and Capt. Gochet, Lieut. Bois and mechanics Rey and Duguffroy being on board.

A STEERABLE KITE.

From Aldershot comes an interesting item of news, to the effect that an English sapper of the name of Voisey has designed a very successful kite, which possesses the property of being dirigible to a certain extent, and which it is suggested may be utilised for dropping explosives. Probably its value for scouting purposes will be found considerably greater.

BARNUM AND BAILEY WANT A FLYING MACHINE.

Messrs. Barnum and Bailey, the well-known American show people, are offering £2,000 for a flying machine of the heavier-than-air type, and a munificent salary to any person who will operate it daily. Will anyone oblige?

FINAL REPORT OF THE COMMITTEE ON THE ADMINISTRATION AND COMMAND OF THE ROYAL FLYING CORPS, &c.

In our last issue we gave the recommendations embodied in the report of the R.F.C. Enquiry Committee, and this week we give the first instalment of the report itself.

Sir,

1. We, the undersigned, being the Committee appointed "to enquire into and report upon the administration and command of the Royal Flying Corps with particular reference to the charges made both in Parliament and elsewhere against the officials and officers responsible for that administration and command and to make any recommendations in relation thereto," beg to present our Final Report.

2. In our Interim Report, dated August 3rd last, we dealt exclusively with the charge of criminal negligence made by Mr. Pemberton Billing, M.P. We do not refer to that charge again.

3. We sat to take evidence on 22 days, hearing 54 witnesses, between May 18th and August 1st, 1916. Whilst all the charges that have been made in public have been dealt with in public, a material proportion of the evidence has, for obvious reasons, been taken *in camera*. We have personally visited several aerodromes, and inspected a number of machines and watched their flight. During our enquiry a large number of charges or criticisms have been brought to our attention; some of a serious, some of a trivial, character. We investigated them all, but we propose, in this Report, to confine ourselves to those charges and criticisms which seem to us of sufficient importance to be worth recording.

4. Many of the charges and criticisms made before us have been based upon hearsay evidence.

What we have done in every such case is to treat the statements made to us not as evidence of fact, but as indications of the directions in which our enquiries should be prosecuted with the view of obtaining all the reliable information procurable.

5. We have been greatly assisted in such enquiries by the frankness with which the various officers of the Royal Flying Corps have given us their evidence, and by their readiness, and especially that of Lieutenant-General Sir David Henderson, K.C.B., D.S.O., Director-General of Military Aeronautics and in command of the Royal Flying Corps, to give us full access to all documents, confidential or otherwise, and to give us every opportunity of personal inspection of such aerodromes, machines and engines as we desired to see.

6. A greater difficulty has been the reluctance of junior officers of the Royal Flying Corps to appear before us, a reluctance with which we sympathised, and which was overcome in a few instances by the arrangements we made to take this evidence in such a way as to ensure non-disclosure of the identity of the witnesses.

7. A similar reluctance was expressed on behalf of aeroplane and engine builders. Of these, only three or four appeared, although we repeatedly expressed our desire to hear any Trade witnesses who had any serious complaint to make. None of the Trade witnesses who came made any complaint, and two of them went out of their way to express their thanks for the assistance that had been given them in their work by the officials of the War Office.

8. Further, certain criticisms of the administration and command of the Royal Flying Corps were made by witnesses anxious for the well-being and improvement of the Service, upon the mistaken assumption that matters to which they directed attention had been overlooked, because the critics were not themselves aware of the activities of the Royal Flying Corps in those directions. This was inevitable in a Service where much must be done as secretly as possible, especially in war-time.

9. A good many complaints which had been made in public about the Air Service proved, on enquiry, to concern the naval and not the military service.

10. In order to keep our report within tolerable compass we have written memoranda on several subjects involving detail and we append those memoranda* to this report. We have been the more disposed to take this course as we feel that a good deal of the information in those memoranda cannot well be made public at the present time. We trust that the body of the report, although less detailed, will be intelligible, apart from the appendices.

11. Before we proceed to deal with the various charges and criticisms submitted to us, it seems desirable to give a general outline of the Royal Flying Corps itself. We set out a more detailed description in our memorandum on the subject in Appendix A.

12. It is sufficient here to say that the Royal Flying Corps consisted of (*a*) the superior officers; (*b*) the pilots who fly the machines; (*c*) the observers; and (*d*) the mechanics who look after the machines.

13. The Royal Flying Corps is divided into flights, squadrons, wings and brigades. The squadron is the unit. . . .

Pilots are practically all officers. Observers are mostly, but not entirely, drawn from the officer ranks of the Army. Wing Commanders rank as Lieutenant-Colonels.

14. Major-General H. M. Trenchard, C.B., D.S.O., is in command of the Royal Flying Corps in France with . . . General Henderson is in supreme command.

15. The Royal Flying Corps has multiplied more than twenty-fold since the beginning of the war and its growth continues. There is, and always has been since the war, a waiting list of pilot candidates. The difficulty in training them has been want of instructors and of school machines. The former is rapidly disappearing; the latter, to some extent, still remains.

16. Perhaps the most noteworthy feature of the Royal Flying Corps system is that now every pilot must be an officer. Either he is an officer before he joins, or he is drawn from the class of civilians from which army officers mostly come and becomes an officer on joining. Much importance is attached to this fact by the heads of the Royal Flying Corps, who attribute the skill and initiative of the pilots largely to it.

17. In considering charges against the administration of the Royal Flying Corps it is essential to know its strength at the outbreak of war. It is not necessary to repeat here all the figures, but we call special attention to the fact that its equipment in aeroplanes and engines consisted then of 179 machines. Of these, 66 were sent abroad with the Expeditionary Force, and of the remainder only about 20 were in serviceable condition. Thus equipped, the Royal Flying Corps started to serve the Army abroad and to train pilots at home.

18. In Appendix B.† will be found a table showing the number of pilots under instruction on May 1st, 1916, the number of instructors and the training schools. It is a specimen of a daily return and shows how the problem of training pilots is being grappled with.

19. When the development of the British Army is considered—together with its demands for pilots, observers and machines in ever-increasing quantities and on many fronts—it is possible to form some notion of the demands made upon the responsible heads of the Royal Flying Corps, and some idea of the work they were called upon to perform, and that, too, under the stress and strain of war.

20. Many of the charges and, perhaps, the weightiest, were made in respect of the equipment of the Royal Flying Corps, and, in order to understand the bearing of those charges upon its administration and command, it is necessary to look a little into its history. We need not go further back than an Army Order dated August 28th, 1913. By this order a Military Aeronautics Directorate was constituted with General Henderson as Director-General. This directorate was charged with the equipment of the Royal Flying Corps. In this capacity, General Henderson has charge of the Royal Aircraft Factory at Farnborough (hereinafter referred to as the R.A.F.). The immediate control of the Equipment Branch of the Service is in the hands of Brigadier-General D. S. McInnes, R.E., D.S.O., who, subject to General Henderson, has charge of the R.A.F. at Farnborough, as well as the Inspection Department and the Contracts Branch. There is no connection between the Inspection Department and the R.A.F. except that both form parts of the Equipment Branch and are under the same control.

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* Not printed.

† Not printed.

21. There is thus one responsible head for :—

(*a*) The efficiency of the Royal Flying Corps as an aerial fighting force,

(*b*) Its equipment, and in this connection,

(*c*) The Royal Aircraft Factory, whose functions were described by Lord Curzon in the House of Lords on August 1st, 1916, as being—

(1) Trial and experiment.
(2) Research.
(3) Preparation of drawings.
(4) Repairs.
(5) Manufacture of spares.

This description is sufficient for our purpose and we adopt it.

(*d*) The inspection Department.

22. The Royal Aircraft Factory has been the subject of much criticism before us, and we shall have constantly to refer to it; but it must be understood that we are only concerned with it in so far as its operations have affected the efficiency of the Royal Flying Corps. With its internal administration, its economical or uneconomical working, its business organisation, we have no concern. These matters have been the subject of another and independent enquiry. The relevance of our reference to the Inspection Department will appear when we come to deal with the question of selection of aeroplanes and engines.

23. We have confined our investigations, as far as possible, to the period of the war. The condition of the Royal Flying Corps at the beginning of the war was the result of a policy for which the heads of the Royal Flying Corps are not responsible, but there are two earlier matters to which it is necessary to refer. One is the difficulty experienced before the war in obtaining money for the development and equipment of the service, a difficulty which has disappeared since the war. The other is the decision not to build large non-rigid airships, and the transfer of the few small airships we had to the Navy, against General Henderson's wishes, in January, 1914. Large airships demand high-powered engines. The Germans have had the advantage of working down from their big engines to the smaller ones required for their various types of aeroplanes, while we have had to work upwards from the smaller to the larger engines, a position which has proved to be distinctly disadvantageous.

24. In reading this Report, two things must be kept in mind. First, we have not inquired into the Naval Branch of the Air Service and only mention it incidentally now and again. The Naval Air Serice is not included in the terms of the reference to us.

Second, all the witnesses agree that there has been a great improvement in the efficiency of the Royal Flying Corps during recent months. The witnesses who attribute the change to their own intervention and agitation are perhaps the most emphatic and speak of the change as marvellous. We think the adjective not undeserved, although, with all deference to the witnesses referred to, the improvement is, in our opinion, the fruit of the unremitting labour of the Directorate of Military Aeronautics ever since the war began, rather than the result of a spasmodic effort due to agitation.

25. The charges against the administration and command brought to our attention may be divided into two classes, general and specific or incidental. Of these, the general charges are the more serious, and we taken them first.

GENERAL CHARGES.

26. The general charges are :—

(1) Want of foresight in failing to make provision for the types of aeroplanes and engines which has proved to be necessary.

(2) "Too blind faith in the R.A.F."

(3) A number of charges against the R.A.F., the most important being that :—

(*a*) The R.A.F. has acquired an ascendency over the minds of those responsible for the administration of the Royal Flying Corps.

(*b*) The R.A.F., in the matter of aeroplanes and engines, is the competitor with private firms and the judge of their productions.

(*c*) The R.A.F. has been a dis-service and not a service to the Royal Flying Corps, in that it has failed to design satisfactory types of aeroplanes or engines, and has discouraged their design and production by private firms.

(*d*) The R.A.F. has copied designs of private manufacturers for its own use.

(4) The insufficient training of our pilots and observers.

(5) The provision for Home Defence has been muddled and inadequate.

(6) Loss of mastery in the air.

(7) Various defects in aerodromes and in the system of lighting landing grounds.

(8) The inadequate arming of aeroplanes.

It will be observed that charges Nos. 2 and 3 (*a*) are the same charges approached from opposite points of view, and we deal with them both under charge No. 2.

Charges 1 and 2 to some extent overlap and run into each other, but we have tried to keep them as distinct as possible.

Subject to these observations, we now proceed to consider the general charges in the above order.

CHARGE NO. 1. WANT OF FORESIGHT.

27. This charge of want of foresight is based, firstly, upon the unpreparedness of the Royal Flying Corps for the war, a condition for which it would be unfair to hold the heads of the Royal Flying Corps responsible. The unpreparedness is undeniable, but it was the result of a policy which was imposed upon them and not determined by them. Nor would any policy which could conceivably have been adopted with the approval of Parliament or the country have provided an air service adequate to the needs of such a war as we are engaged in. Secondly, the charge is based upon want of imagination in foreseeing and providing for the number and types of aeroplanes and engines which now prove to be required. Aeroplanes have to be built to suit the available engines, and not engines to suit aeroplanes. It has been found that, for other purposes than fighting, high-powered engines and big aeroplanes are wanted. For long reconnaissance work, for weight carrying, such as wireless gear, bombs and the like, for artillery observation, and especially for mounting a gun for attacking dirigibles, big aeroplanes and engines are required. In the early stages of the war it seemed that they might be required for fighting purposes also, but the view now held is that for fighting purposes what is wanted is a small, easily manœuvred, fast machine. The charge of want of foresight practically comes to this: Failure to anticipate the necessity for high-powered engines and to provide for their production. Closely connected with this charge is that of failure to order in due time certain types of engines which, although not exactly high-powered engines, were yet superior to any the Royal Flying Corps had. We deal with this charge under the next head—that of too blind faith in the R.A.F.

28. The position at the outbreak of war was that the engines available did not exceed 80 h.p. Soon afterwards there was the Canton-Unné (Salmson) of 140 h.p. All these have since been discarded. The Royal Flying Corps also got within the first few months the 90 h.p. R.A.F. and 120 h.p. Beardmore—the 90 h.p. R.A.F. in by far the largest numbers. Later the Royal Flying Corps obtained the 100 h.p. Monosoupape and 110 h.p. Le Rhone, the latter in small quantities. Later still the 110 h.p. Clerget, but substantially the highest horse-power engine which the Royal Flying Corps had in quantity for many months was the 90 h.p. R.A.F. Quite recently it has had the 140 h.p. R.A.F., the 160 h.p. Beardmore (orginally known as Austro-Daimler, and now sometimes as the Austro-Daimler Beardmore) and the 250 h.p. Rolls-Royce. So far only a few of these higher-powered engines have been delivered; but the output is increasing, and there are now other high-powered engines in sight. The Royal Flying Corps has, in effect, been carrying on with engines the bulk of which did not exceed 90 h.p. together with a few very efficient 100 to 120 h.p. engines.

29. The state of affairs thus disclosed was obviously unsatisfactory until recently, especially in view of the fact that the Germans have had from the first engines of considerably higher power, notably the Mercedes.

30. In order to understand the position we must go back to the spring of 1914. There was then held a naval and military engine competition for engines of from 90 h.p. to 200 h.p., with a prize of £5,000 for the best engine. There were 67 entries. Of these 23 were of engines from 125 h.p. to 200 h.p. There was only one of the latter. Only nine engines came through the test. The prize was won by the 100 h.p. water-cooled Green Engine. The highest-powered engine to come through was one of 120 h.p.

31. The R.A.F. before the war was designing a 200 h.p. water-cooled engine, and had proceeded some way with the drawings by August, 1914. General Henderson, who was one of the judges at the engine competition, was of the opinion that high-powered engines would be required. He hoped, having regard to the entries for the competition, and the high standing of some of the competitors, that private firms would proceed to develop and perfect high-powered engines, and he stopped the R.A.F. designs, and handed the drawings over to the Rolls-Royce Company and Messrs. Napier. The former declined to proceed on the R.A.F. lines, but designed independently the 250 h.p. Rolls-Royce engine, which is just beginning to be delivered. The Napier Company proceeded with the R.A.F. designs in collaboration with the R.A.F., and their joint efforts have produced a 200 h.p. engine, which is now being tested. There has been some delay in procuring deliveries of the Rolls-Royce engine. No blame can be attributed to General Henderson in that regard. The somewhat longer delay in producing the R.A.F. Napier engine is probably due to joint collaboration.

32. The desire of the Royal Flying Corps for high-powered engines was well known even before the war, and was the subject of discussion between General Henderson and some of the best known engine builders, a few of whom have attempted to design and build such engines, but hitherto without practical result in the matter of aeroplanes. Some promise well, and in one or two cases where deliveries have been made of high-powered engines attempts have been made to design aeroplanes for them, but, so far, without success.

33. General Henderson stated to the Committee that he made a serious mistake in stopping the R.A.F. from proceeding with their 200 h.p. engine design. We do not agree with him. We see no reason to suppose that the opposite course would have resulted in the earlier production of high-powered engines.

34. It is to be regretted that General Henderson's anticipation of getting high-powered engines from private firms, who knew that they were wanted, was not earlier realised, but that is not due to any fault of his.

35. We think this charge of want of foresight is unfounded.

(*To be continued.*)

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AVIATION IN PARLIAMENT.

The Air Ministry.

In the proceedings in the House of Commons on the Committee Stage of the New Ministries and Secretaries Bill on December 19th, Sir G Cave Home Secretary, moved the following new clause :—

"For the purpose of organising and maintaining the supply of aircraft in the national interest in connection with the present War, it shall be lawful for His Majesty to establish an Air Board, consisting of a President appointed by His Majesty, who shall hold office during His Majesty's pleasure, and of other members who shall be appointed in such manner and subject to such provisions as His Majesty may, by Order in Council, direct. The President of the Board shall act with the advice of the other members of the Board.

"For the purposes of this Act the President of the Air Board shall be deemed to be a Minister appointed under this Act and the Air Board a Ministry established under this Act."

Sir G. Cave said : The effect of this Clause will be to establish an Air Board. As hon. members know, the Air Board has practically existed for some months. It was formed by the Government, and represents the War Office, the Admiralty, the Ministry of Munitions and several other Departments. The Board has, of course, a President who has considerable power, being a Cabinet Minister, but the Board up to now has had no statutory existence. We are desirous of regularising the present position.

Mr. H. Samuel : We are very ready to assent to this new Clause. There is a very great deal of interest in the Air Board. Its composition and its functions are all of vital importance in the conduct of the War, and of a successful military and naval Air Service. The right hon. and learned gentleman has told us that the new Air Board, which the new Government proposes, will be, in effect, the same as the old Air Board—at least, I understood him so to say.

Sir G. Cave : Yes.

Mr. H. Samuel : The House will be interested to learn that. Indeed, I think that it is revealing no secret to say that one of the last acts of the late Government was to settle the constitution of the Air Board, and I understand that the new Government is continuing the Air Board on the same lines. I do not know whether the Home Secretary can satisfy the curiosity which, I am sure, will be felt by many members of the House at the words of the Home Secretary that Lord Curzon will not continue to be President of the Air Board. If the right hon. and learned gentleman is in a position to tell the House and the country who the head of this important body is to be I am sure the information will be generally welcomed.

Sir G. Cave : I did not say that Lord Curzon would not hereafter be head of the Air Board. I was only desirous of guarding myself against the suggestion that he would continue as head. I am afraid I cannot go beyond that.

The Clause was ordered to be added to the Bill.

The following Clause was also added to the Bill :—

"The Air Board shall in relation to aircraft have such powers and duties of any Government Department or authority whether conferred by Statute or otherwise, as His Majesty may, by Order in Council, transfer to the Board, or authorise the Board to exercise or perform concurrently with or in consultation with the Government Department or authority concerned."

At the third reading of the Bill, on the following day, Mr. Ashley moved to leave out the Clause regarding the establishment of the Air Board. He said : I move purely formally to leave out this Clause in order to ask what will be the powers of the Parliamentary Secretary of the Air Board which it is proposed to appoint. We shall probably have a whole day after the House reassembles for discussing the constitution and powers of the Air Board. It was promised us by the last Government, and I am quite sure that the present Government will keep that promise. Before we go off for the holidays I wish the right hon. gentleman could give us some indication what will be the powers of this Parliamentary Secretary and what he will answer for, what the composition of the Board will be, and what his powers will be. I am glad to say that the Board has now been turned into an Air Ministry. I suppose it is the work of the right hon. gentleman, and I thank him that we have at last got an Air Ministry, if only in name. I want to know whether their duties will be entirely advisory, or whether they will have executive power. Up to now the Board has consisted of a Cabinet Minister, a member of the other House, a member of this House, and representatives of the Army and the Navy. I want to know whether a representative of the Ministry of Munitions is going to be added to this Board. I would lay great stress on that, and, if it has not been so decided, I would urge upon the right hon. gentleman whether the matter could not be reconsidered. After all, nothing can be done, as the right hon. gentleman knows, without the Minister of Munitions. He has absolute control over all the men and the materials in this country, and this Air Board must come up against the Ministry of Munitions whatever it does. Unless, therefore, there is a representative of that Ministry on the Board I am afraid that there will be great trouble.

There is, as the right hon. gentleman knows, an International Commission in this country which lives at India House, and which buys aircraft material for our Allies. Great power is being given to the Air Board, far greater power, I hope, than it had before, and I would press upon the right hon. gentleman to consider whether it would not be advisable to put on the Air Board a representative of that International Commission ; otherwise they will be in a very difficult position in supplying the needs of our Allies. They will have no say at all in the getting of the material, and we may find that our Allies are not properly supplied as they should be. Finally, will the powers of this Air Ministry continue after the war, or will they cease when the war is over ? I hope the right hon. gentleman will see his way to make the Ministry permanent. We are told that the Labour Ministry is going to continue. Why should not the Air Ministry continue ? It is perfectly obvious that aviation in the future must be of far greater importance than it has been in the past, and why the Ministry should cease—in the case of the Under-

Secretary, six months after the end of the war, and in the case of the Ministry as a whole, 12 months after the war—I cannot see. Surely it would be better to let it remain on and make any alteration in its composition or powers which may be necessary after the war.

Mr. Lynch: I wish to offer a few remarks on this Clause. I think perhaps, they would be more in order on the new Clause. It seems to me that the hon. gentleman who has just sat down in the course of some very valuable remarks has addressed himself to a question which appertains more closely to the new Clause. With my hon. friend I would like to know a little more about the constitution of this new Air Board or Ministry, or whatever it may be called. I would like to lay stress upon one point particularly. The Minister responsible should have a seat in this House. If he is a representative in another place he is far removed from our sphere of action and the greater mental activity which prevails in this House, and really we have no control over him whatever. We have no control, moreover, over his representative, because in nine cases out of ten he simply replies that he will consult his noble friend. He has no authority to give a definite reply to any important question whatever. It seems to me, therefore, not only an important point, but an essential point, that the Minister responsible should be in this House.

We were never able to obtain any definite information with respect to the last Air Board. It seemed to work in the dark, and we were certain only of one thing, and that was that it never produced any valuable result at all. It left the question of air supremacy pretty much where it took it up, and its only effect was that it acted as a sort of breakwater to public opinion and to the opinion of this House in order to delay the solution of this most important question. I hope, therefore, that with the change of Ministry there will be also a change of methods—more activity and more real work, more energy and more determination to produce something definite and concret than has yet been shown by the Board. Failure was stamped on that Board from the very beginning, because, instead of being a real workmanlike Board full of men of great brain power and with great capacity for producing really valid and bold plans, its composition reminded one of the ornamental names which fill the directorships of showy city companies. Now is a time when we do not want ornamental names or titles or frippery of that sort. We want brains; in fact, I could emulate the Prime Minister yesterday and say three times the same thing. We want brains, brains, brains, and not one tithe of the brains which this country commands has been utilised even in this great new forward Government. Now is the time to watch the composition of this Air Board very closely and to take it as a kind of touchstone showing the real value of this new Government, and how much the country has gained by this great change. Up to the present all the signs have been disappointing. I leave the matter at this stage, to return to it with greater force and with the intention of offering perfectly definite concrete suggestions later.

Sir G. Cave: With regard to the composition and powers of the Board, as my hon. friend will understand, the matter has not yet been finally settled. It is still under consideration, and I am afraid I cannot give him a final answer to-day. I have reason to believe that it is proposed that the Ministry of Munitions shall be represented on the Board, but with regard to the other body mentioned by the hon. member I take a different view from him. I think there would be an objection to having it represented on the Ministry. The proposal is that the Ministry should be created for the war and should continue for a year after the war. That will leave ample time, and I have no doubt that the question of continuing the Board will be taken into consideration as soon as the war comes to an end.

Mr. Lynch: Will the head of the Board be in this House?

Sir G. Cave: I cannot say.

Mr. Montagu: Has any decision been come to yet by the Government as to the means of supplying aircraft?

Sir G. Cave: That is under consideration. It will be considered in a few days as part of the arrangement for setting up the Board.

The Amendment was, by leave, withdrawn.

SOME OF THE MORE RECENT GERMAN AEROPLANES.

Although up to the present detailed photographs of the latest German aeroplanes now in use on the Western front have not been available for publication, a certain amount of information regarding them is to hand from various sources, which may not, even in the absence of illustrations, be without interest to our readers. The latest *Fokker biplane* is very similar to the fast Fokker monoplane. The upper and lower planes are both of the same span and chord, with slightly raked ends. The wings are perfectly straight, that is to say, there is no dihedral angle and no backward slope. On each side are two pairs of inter-plane struts of round steel tube, streamlined with wood, and the bracing is unusual in that lateral stability is maintained by warping instead of, as is now universal practice, by *ailerons*, and that therefore there are no incidence wires, while the rear lift and landing wires are at the same time warp wires.

The gap between the planes is very small, so small, in fact, that the top plane almost rests on the upper *longerons* of the body, to which it is attached by a low *cabane*. The tail planes are of the usual Fokker type, *i.e.*, the rudder is partly balanced after the fashion of the pre-war Avros, while the elevator is identical in shape with that of the Morane monoplanes. The body is of the modern Morane type, hexagonal in section, and flattening out to a horizontal knife edge at the rear. An Oberursel monosoupape engine is fitted and drives a Garuda propeller. The machine-gun is fired through the propeller field.

The *Roland biplane*, of which a good deal has been heard lately, is, perhaps, the greatest departure from the beaten track of any modern German aeroplane. It has, according to Mons. Jean Lagorgette in *l'Aerophile*, the peculiarity that its *fuselage* is as deep as the gap between the main planes, the top one of which is actually attached to the upper *longerons* and the bottom planes secured to the lower *longerons* in the usual way. In the modern L.F.G., or Roland, biplane the totally enclosed body, which the Avro firm were the first to introduce, would appear to have been taken into use for military purposes. There can be little doubt that for winter flying this type has many advantages, and it is really surprising that nothing has been done along these lines before, although, perhaps, the reason is to be found in that the view and the range of fire must be thereby restricted. That it now has been taken up again, even if it is by the Germans, is another proof, if such were needed, of how far ahead of his time was Mr. Roe in those early days. First with the tractor biplane, first with the efficient low-powered triplane, first with the enclosed monoplane and biplane, all three forms that are now coming into their own. However, to return to the Roland, the wings are of short span—some 30 ft.—whilst there is only one strut on each side, which is made up of three-ply wood and has, in addition to its action as a strut, the function usually assigned to the incidence wires. Inside the large body, which is of elliptical section, are the two seats arranged in tandem, the gunner occupying the rear one. In the neighbourhood of the occupants' seats are a number of windows in the *fuselage* through which pilot and observer obtain their view and through which the machine-gun is fired. The engine used is a 160 h.p. Mercedes, and the machine is credited with the following performance: 500 metres in 4 minutes, 1,000 metres in 8 minutes, 1,500 metres in 14 minutes and 2,000 metres in 22 minutes.

The *Halberstadt biplane*, of which we published an illustration some little while ago, has two pairs of struts on each side in spite of its short span, about 28 ft., and is driven by a 120 h.p. Argus motor. The *fuselage* is of the Albatros type, *i.e.*, built without internal cross-bracing, the necessary rigidity being obtained by covering it with three-ply.

Another machine which is coming into evidence is a small *Albatros* single-seater scout, which has been nicknamed the "German spad." This machine has little resemblance to the standard Albatros biplanes as we know them. The span is only about 27 ft., and there is only one pair of struts on each side. Needless to say, the engine is a large water-cooled stationary motor, but what make is fitted as standard is a little uncertain. Both planes are of nearly the same span, and there is no dihedral angle. The *fuselage* is of the *monocoque* type, or, more correctly speaking, it is of rectangular section as regards its main structure, the flat sides and top being streamlined with formers and stringers. The tail plane is rounded as in all the later type Albatros biplanes, and the rudder is slightly ahead of the elevator.

Personals.

Casualties.

Lieutenant Eyon George Arthur Bowen, Royal Garrison Artillery, attached R.F.C. (posted as missing, now reported killed), was born in August, 1893, and passed out of Woolwich into the Royal Artillery in December, 1913. He had promotion in June of last year, and in May of this year he was appointed Flying Officer in the R.F.C.

Lieutenant R. R. Gaskell, R.F.C., whose death is reported, was the only son of Mr. and Mrs. P. Gaskell, of Newland Park, Hull. He joined the Colours in September, 1914, and was made Second Lieutenant in the Royal Engineers, and served in France six months with Colonel Newell's battalion. He afterwards joined the R.F.C., and was Flying Observer for eight months in France. He was flying for his pilot's certificate when the fatal accident happened.

Lieutenant Ivan Heald, Royal Naval Division, attached R.F.C., killed in action on December 4th, was a nephew of Mr. John Shackleton, one of the first directors of the North of Ireland Paper Mills, and of Mr. A. Ross, Ballyclare.

Lieutenant Arthur Goulburn Brooke, R.F.C., who was accidentally killed on December 10th, was the youngest son of Mr. J. M. Brooke, of Childerley Hall, Cambridgeshire, chairman of the Chesterton Board of Guardians. He was born in 1892, and was educated at Chigwell School, Essex, and at the Leys School, Cambridge. Five years ago he went to Canada, but returned on the outbreak of war and enlisted in the Northants Yeomanry. After serving in the trenches in France for more than a year, he joined the R.F.C., and obtained his commission in March last. His only surviving brother, Lieutenant B. Brooke, has been at the front almost continuously since the outbreak of the war.

Wounded.

Captain Eustace Osborne Grenfell, M.C., Royal Garrison Artillery and R.F.C., wounded, was born in 1890, and after having served for a little over a year in the Territorial Force, got a Lieutenancy in the Royal Artillery in August, 1915. On the same date he went into the R.F.C., and for some time this year was Instructor at the Royal Central Flying School. He got his Captaincy in September last year.

Married and to be Married.

The engagement is announced of Flight-Lieutenant Egbert Cadbury, R.N.A.S., to Miss Mary Forbes Phillips, daughter of the Rev. C. Forbes Phillips, Vicar of Gorleston, and well known as a writer of plays. Lieutenant Cadbury was awarded the Distinguished Service Cross for his successful attack on a Zeppelin in the last raid on November 28th. He is 23 years of age, and is the youngest son of Mr. George Cadbury, head of the firm of Cadbury Brothers (Ltd.), of Bournville, Birmingham. Miss Forbes Phillips has frequently appeared in her father's plays, and has written many poems and short stories.

A marriage has been arranged between Commander Clement Richard Dane, R.N. (Wing Commander, R.N.A.S.), eldest son of Sir Louis W. Dane, G.C.I.E., C.S.I., I.C.S. (retired), late Lieutenant-Governor, Punjab, India, and Lady Dane, of King's House, Lyndhurst, New Forest, Hants, and Bessie Albinia, only daughter of Dr. and Mrs. T. Sandby Coombe, of St. Werburgh Lodge, Hoo, North Kent.

An engagement is announced between Captain C. W. W. Darwin, Coldstream Guards and R.F.C., eldest son of Colonel and Mrs. Charles Darwin, Elston Hall, Newark, and Dryburn, Durham, and Sibyl, youngest daughter of Mr. and Mrs. Charles Marston Rose, of 22, Hans Place, London.

The marriage arranged between H. M. Goode, R.F.C., and Kathleen Noel Banks, daughter of Mrs. Archibald Marshall, will take place at Chateau d'Oex on December 28th.

The marriage of Mr. Claude Grahame-White, to Miss Ethel Levey, the *revue* actress, took place on December 21st at the St. Marylebone Register Office.

A marriage is arranged, and will shortly take place, between Captain Hugh Holden, R.A., only son of Sir Capel Holden, C.B., and Lady Holden, and Margaret, eldest daughter of the late John Wyndham and Mrs. Knight Bruce, of The Sanctuary, Crediton.

Lieut. Francis Godfrey Baylie Reynolds, R.F.C., only son of Mr. and Mrs. B. L. Reynolds, of Overleigh, High Wycombe, was on December 14th, at St. Martin's-in-the-Fields Church, Trafalgar Square, married to Doris, youngest daughter of Mr. and Mrs. R. Longman, of The Lodge, Rectory Avenue, High Wycombe.

Items.

The Admiralty have sent the following message to Mr. C. E. R. Stevens, of Jersey, concerning his son, previously reported missing, Flight Sub-Lieutenant Alick C. Stevens, R.N.V.R. :—" Beg to inform you German official report states that two airmen taken prisoners from damaged English aeroplane at mouth of Thames by German submarine. This presumably refers to your son. Inquiry is being made, and any further information received will be immediately communicated." This probably refers to the Berlin report on December 2nd that a German submarine, finding a damaged British aeroplane near the mouth of the Thames, made prisoners of the occupants, two British coffiers.

The will of the late Captain Basil Hallam Radford, Kite Balloon Section, R.F.C., of Park Crescent, Portland Place, W., better known to theatre-goers as Basil Hallam, the original Gilbert the Filbert, who was killed near Albert on August 20th, through his balloon breaking away and his parachute failing to open, has been proved at £556.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British. *War Office, December 20th.*

" *East Africa.*—Our aeroplanes have carried out bombing raids with considerable success, and inflicted appreciable casualties. Rain is falling heavily."

General Headquarters, December 21st, 10.20 p.m.

" The improvement in the weather yesterday led to considerable activity in the air. In the course of the raids carried out by our machines a ton of explosives was dropped on points of military importance behind the enemy's lines. Much fighting took place in the air. One enemy machine was destroyed and six others were driven down damaged. Four of our machines are missing."

War Office, December 21st.

" *Mesopotamia.*—During the night of the 17th-18th British aeroplanes successfully bombed the enemy's river craft west of Kut-el-Amara.

French. *Paris, December 19th.*

" On Sunday night two German aeroplanes were brought down by our pilots on the Verdun front. One of the enemy machines fell on the Herbebois, the other came crashing to the ground near Ornes. Last night our bombarding squadrons dropped 600 kilogrammes (nearly 12 cwt.) of explosives on the railway stations of Dun-sur-Meuse and Montmedy and on bivouacs near Azannes."

Paris, December 21st.

" On the Somme front four enemy aeroplanes have been brought down by our pilots, the first near Manancourt, the second in our lines in the neighbourhood of Clery, the third

400 metres from Devise, and the fourth south of Rouy-le-Grand. This last one was brought down by Sub-Lieut. Nungesser, which brings the number of enemy machines brought down by this pilot to 21. One of our pilots, chasing a German aeroplane, collided with his enemy. The two machines crashed to the ground.

"Yesterday 48 bombs were dropped on the station of Anizy. During yesterday evening four of our machines dropped 480 kiloms. of bombs on the railway stations of Brieulles-sur-Meuse and Charleville-Mezieres. Between 5.15 and 6.40 eleven of our aeroplanes set out to drop 47 bombs of 120 mm. on the station and the barracks of Nesles, on the bivouacs and also on convoys which were on the march."

Russian. *Petrograd, December 20th.*

"*Black Sea.*—On December 16th an enemy seaplane, escorted by a destroyer, dropped bombs, without result, on Sulina. The seaplane was hit by our aviator Ragozini, and fell into the sea, but owing to the rough weather we were unable to capture it."

Italian. *Rome, December 19th.*

"Hostile aircraft dropped bombs in the Upper Cordevole Valley and on Auronzo, where one of our hospitals was hit. Some people were wounded. The damage is slight."

Rome, December 21st.

"Yesterday along the whole front, the weather being fine, artillery and aircraft were more active. On the Trentino front . . . enemy aircraft attempted raids over our lines, but were in all cases driven off by the fire of anti-aircraft batteries.

"On the Julian front . . . our aeroplanes bombed the railway station of Dorimberga (Dornberg), in the Frigido (Vippach) Valley, and the rear of the enemy lines on the Carso. Notwithstanding the fire of numerous batteries all our machines returned safely."

German. *Berlin, December 18th.*

"German seaplanes yesterday dropped bombs on the Russian naval forces in the harbour of Sulina (on the Dobrudja coast at one of the mouths of the Danube) and brought down a hostile seaplane by machine-gun fire."

Berlin, December 21st.

"In a number of air-fights and as a result of our anti-aircraft fire the enemy lost six aeroplanes in the Somme region."

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SIDE-WINDS.

Strafe the war once again by way of a finish to the year, with an additional strafe thrown in by reason of its being the cause of stopping those very pleasant little reminders of Christmas which emanate from the Coan Aluminium Castings Depôt, Goswell Road way. Last year it was the same, but the good will is there just the same, so we're not going to sorrow after *our* particular bit of aluminium, but rather hope it carries with it, whatever form it happens to take, the accounting for a Hun or two. So here's a reciprocal greeting, in something round about 50 per cent. under, to friend Robert W. Coan, to his wishes for "A Happier and Brighter New Year" and that "next year will bring along the dear old peaceful times of happiness we used to enjoy."

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The Clarendon Restaurant, Hammersmith Broadway, was the scene on December 21st of a very successful gathering of between 200 and 250 of the men and women employees of the Davidson Aviation Co., Ltd., Hammersmith, for their First Annual Works Dinner. Mr. P. L. Mott, who has recently joined the Directorate, occupied the chair, supported by His Worship the Mayor of Hammersmith and Mr. W. E. Chester, the Managing Director. After the usual loyal toast, Mr. W. E. Chester, in proposing the health of the Chairman, stated that Mr. Mott had such confidence as regards the future of the Davidson Co., that he had given up a successful business in the City to join the Board, and they all felt it a considerable honour that he had done so. Originally commencing with about 24 employees, the firm now had a staff of workers numbering something like 500, which was sufficient evidence that the work turned out gave complete satisfaction in the right quarter. Their motto was, however, to go forward, and he hoped that this first gathering was only the forerunner of many such meetings in the future, when he hoped to see the number present tripled or quadrupled. The Mayor, replying for "The Visitors," said Hammersmith was proud to have some of the most successful businesses of the country in their midst, and from what he saw and from what he had heard from the Managing Director, he felt sure that success was assured to the Davidson Aviation Co. On behalf of the Borough, he wished the Company every success and good wish. A splendid musical programme had been arranged, but owing to its length and the appreciation of the turns it had to be considerably curtailed.

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